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EQUOBOX RTU-M-BUS User Guide

Rev 0.0.3

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1. INTRODUCTION

1.1 Purpose of the document

This document is a guide to the installation, configuration, and commissioning of the *EQUOBOX RTU, code SIN.EQRTU1, hereinafter referred to as RTU*. This document is intended for technical personnel with an average knowledge of electrical engineering, IT, basic TCP/IP principles, and M-Bus systems.

The RTU has an embedded webserver and is a datalogging and consumption monitoring system for heating and cooling systems equipped with meters that communicate using the M-Bus protocol. The use of the EQUOBOX LC, code *SIN.EQLC1, hereinafter referred to as LC,* is required to communicate with the M-Bus devices.

The first section of this guide is dedicated to the description of the technical specifications of the RTU and its commissioning. We will describe how to commission the plant, scanning and adding meters. Then, we will describe the advanced configuration via web interface and, finally, how to generate consumption reports and plans.

1.2 Content of the packaging

The RTU packaging contains:

- RTU datalogger
- Installation leaflet

2. RTU TECHNICAL DATA

The RTU is a hardware device with no moving parts, made in compliance with industrial standards, which can be DIN-rail mounted inside an electrical panel. The main technical specifications of the device are shown below:

- Operating temperature range: [-5 / +45 °C]
- Storage temperature range: [-25 / +55 °C]
- Protection Rating: IP20 (EN60529)
- Fastening: 35mm DIN bar (EN60715)
- Dimensions: 4 DIN modules (90x72x64.5)
- Power Supply: [12-24Vac/12-24Vdc]
- Power consumption: Max 3W

3. RTU APPEARANCE

3.1 Description of the RTU

The RTU is one of the two dataloggers of the EQUOBOX family. The main functional features described in this document are summarised below:

- Webserver-based datalogger
- Manages up to 250 M-Bus meters

- 4GByte internal memory
- Data logfile of daily synthetic data for up to 10 years
- Daily readout logfile for 1 year
- Data logging interval between 15 minutes and 24 hours
- Remote system management, meter readout, report sending, alarm management, and event management
- 9-24 Vac/ Vdc power supply or Power Over Ethernet
- 3 digital inputs for logic control and remote control
- 2 relay outputs (Max 2A@230Vac) for logic control and remote control
- Maximum power consumption: 3W
- DIN rail mount (4 modules)
- 128x96 pixel OLED display for local consultation and configuration
- 6-key membrane keyboard

3.2 RTU

An image of the RTU with its main functional parts is shown below:

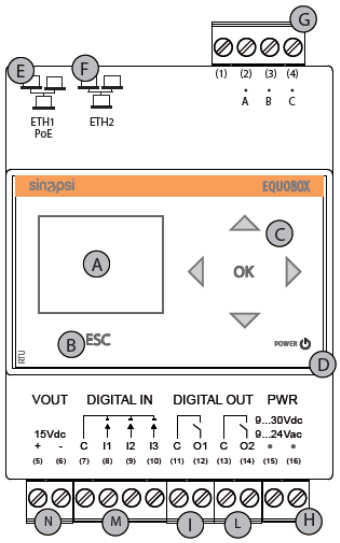


Figure 1 - View of the RTU

A. 128x96 pixel OLED monitor (16-level grayscale)
B. Navigation button (ESC)
C. 5-key navigation keyboard (UP-DOWN-LEFT-RIGHT-OK)
D. Operating status LEDs
E. Ethernet Port 1 (PoE)
F. Ethernet Port 2
G. LC bus connector
H. Power supply input connector
I. Output connector to relay 1 (NO contact)
J. Output connector to relay 2 (NO contact)
K. Digital input connector
L. Auxiliary voltage output connector for digital inputs

4. GENERAL INFORMATION ON THE SYSTEM

4.1 Overview of the system

This is a consumption monitoring and metering system based on a standard M-Bus communication protocol (EN13757). All the meters that use this communication protocol can be connected and will be managed by the system with all the functions it features.

The LC is required to allow the RTU to communicate with the M-Bus devices. An example of the system architecture is shown below

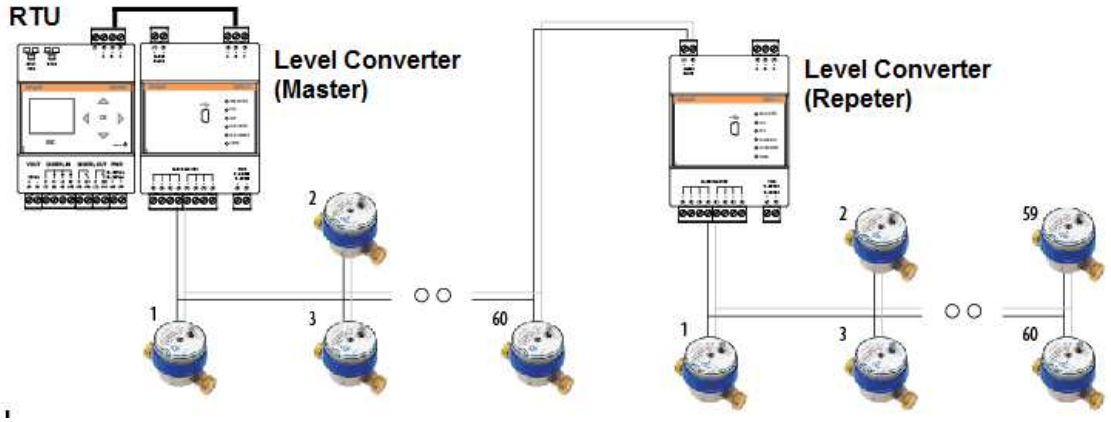


Figure 2 - System architecture

The RTU can manage up to 250 meters, whereas the single LC can manage up to 60 M-bus nodes. In the event that there are more than 60 M-Bus nodes to be managed with the same RTU, you can use one or more LCs in Repeater mode.

4.2 M-Bus system

The M-Bus (Meter Bus) system is a communication protocol compliant with the EN1434-3 standard. The M-Bus System provides the following advantages:

- High level of data transmission security
- Low wiring costs
- Long distances without requiring repeaters
- Large number of central units
- Detection of both battery-powered and mains-powered devices
- Automatic device recognition
- Vast array of systems and components available
- Different types of bus topology: linear, star, and tree

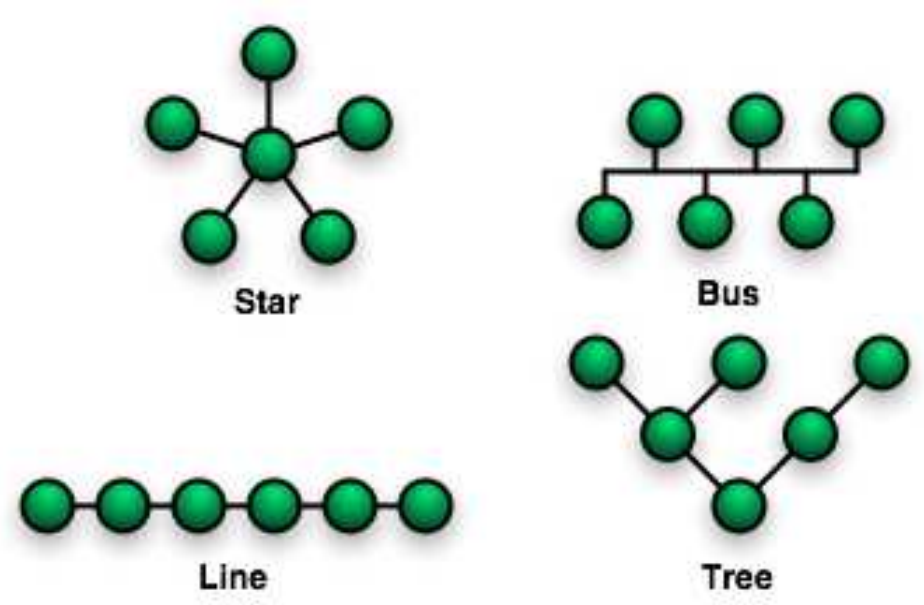


Figure 3 - Bus topologies

4.3 Addressing

The M-Bus protocol provides two types of addressing modes to detect and communicate with the devices connected to the bus

- *Primary addressing*: up to 250 primary addresses can be allocated within an M-bus system (hexadecimal format). The primary address is normally allocated while setting up the units.
- *Secondary address*: the secondary address consists of 8 bytes and allows the allocation of any number between 00000000 and 99999999. By default, the secondary address of the devices is the same as the manufacturer serial number. Readouts by secondary address while scanning the bus allow the acquisition of the meters that support the "Wildcard" logic, the same that enables the selection of a group of devices based on the section of their serial number.

4.4 Sizing the M-Bus System

Follow the instructions provided in the table to size the M-Bus system

Type of plant	Maximum distance	Overall cable length	Cross-section mm^2	Number of devices (slaves)	Max. transmission rate
Small residential buildings	350 m	1000 m	0.8 mm	250	9600 Baud
Large residential buildings	350 m	4000 m	0.8 mm	250	2400 Baud
				64	9600
Small complex	1000 m	4000 m	0.8 mm	64	2400 Baud
Large complex	3000 m	5000 m	1.5 mm^2	64	2400 Baud
Medium neighbourhood	5000 m	7000 m	1.5 mm^2	16	300 Baud

Point-to-point connection	10000 m	10000 m	1.5 mm^2	1	300 Baud

4.5 BUS signal specifications for SIN.EQLC1

M-Bus system	Designation	Condition	Minimum	Typical	Maximum	Measurement unit
Number of devices per segment	n	SIN.EQLC1	0		60	
Transmission rate	T	$C_{segment} \leq 382nF$	300	2400	9600	Bd
Bus voltage	U	IM=0…400mA	12		42	V
Bus Voltage (Master)	U_M	IM=0…400mA	24	40	42	V
Bus Voltage (slave)	$U_{S,R}$	$I_S \leq 1.5mA$	±21		±42	V
Bus current	$I_{M,V}$	SIN.EQLC1	0		90	mA
DC Bus current	$I_{M,K}$	SIN.EQLC1	130	500	160	mA
Current (slave)	$I_{S,R}$	US=21…42V	0.75	1.2	1.2	mA
Transmitted current (slave)	$I_{S,S}$	US=21…42B	11		20	mA

5. INSTALLATION

Carefully follow these instructions to install the device, in order to be able to commission the system in the best possible way. The device must be installed by qualified personnel, specialised in the installation of electrical equipment.

5.1 Mechanical assembly

This device has been designed to be DIN-rail mounted; therefore, no other mounting options are allowed. The DIN-rail mount consists of the following steps:

- Fasten the DIN rail to the bottom of the electrical panel (if it is not already provided with it)
- Remove all the terminals of the device before hooking it on the DIN rail
- Place the recess at the bottom of the device on the upper part of the DIN rail, keeping it at a 45° angle with the rail. Turn the device until it engages with the rail.

Carefully read the following notes
To prevent mechanical stress on the terminals, which could damage the device, it is important to wire the terminals disconnected from the device. Follow these instructions: • Remove the terminals from the device pulling outwards • Tighten the cables to the removed terminal complying with the right polarity • Reinsert the terminal with the cables placing it in its correct position

5.2 Electrical installation

Verify the following before commissioning the device:

- Ensure that the electrical panel where the device is installed is powered off
- Verify the presence of power supply protection devices (fuses, circuit breakers, differential switches)
- Ensure that the supply voltage is within the operating limits of the device and that the supply power is enough to ensure the proper operation of all the devices connected to it, verifying the maximum power consumption of each one of them
- If you opt for a PoE (Power Over Ethernet), ensure that the network cable is connected to Eth1 and that the PoE switch is suitable for the device.
- Ensure that the LC is connected properly to the M-Bus network and to the supply voltage (refer to the installation manual)
- Ensure that the RTU is connected properly to the LC via the serial bus marked A-B-C
- Ensure that the modem router (if any) is installed according to the instructions of the manual
- In the event of data connection, ensure that the Ethernet cable is crimped properly and connected to Eth1 or Eth2

5.3 Serial connection to the LC

Before connecting the device to the LC (SIN.EQLC1), ensure that the latter is installed correctly, according to the instructions in the installation manual.

Connect the RTU to the LC as shown in the figure:

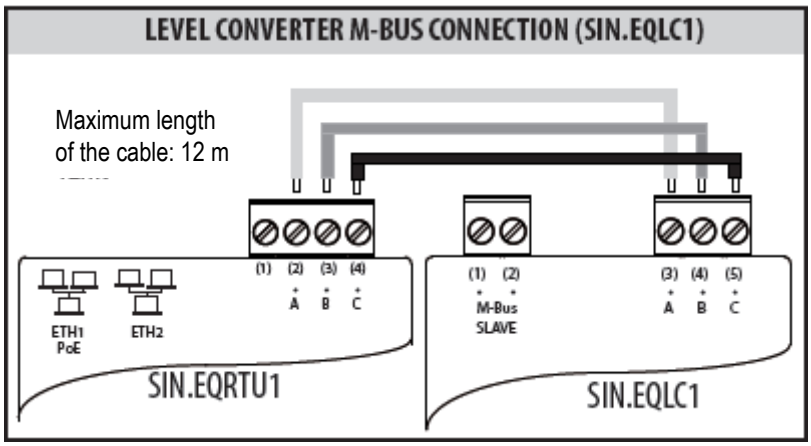


Figure 4 - Type of connection

If the serial connection to the LC is correct, the TX LED on the front of the LC will start blinking in synch with every communication with the M-Bus devices connected to it.

5.4 Connection to a local PC via Ethernet (LAN)

The device is equipped with two Ethernet ports ETH1 and ETH2 to connect it to a PC either connected to a LAN network or directly via an Ethernet cable.

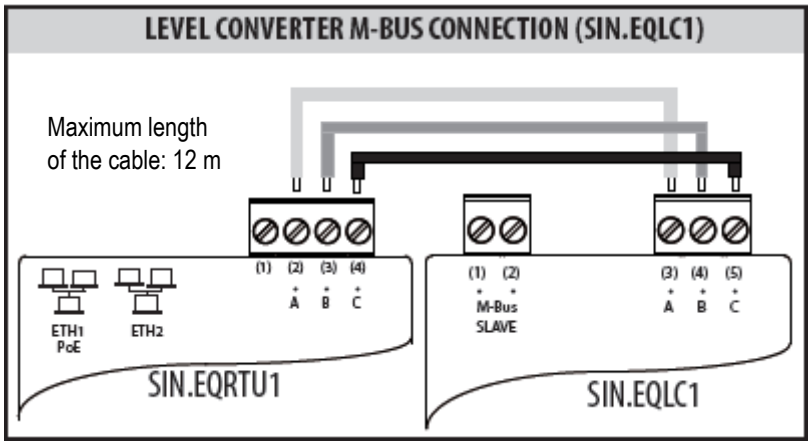


Figure 5 - LAN connection

To connect the device directly or via the LAN network of a PC, follow the instructions below:

- Use a standard T568A or T568B Ethernet cable (straight through or crossover) to connect the ETH1 or ETH2 port of the RTU to the Ethernet port of the computer or to an existing LAN socket. If you use an existing LAN, connect the computer to another LAN socket
- Verify the RTU IP address from the display by accessing the RTU INFO menu (Chapter 8.4) and ensure that that the ETH icon corresponding to the Ethernet connection indicates that the cable is connected properly

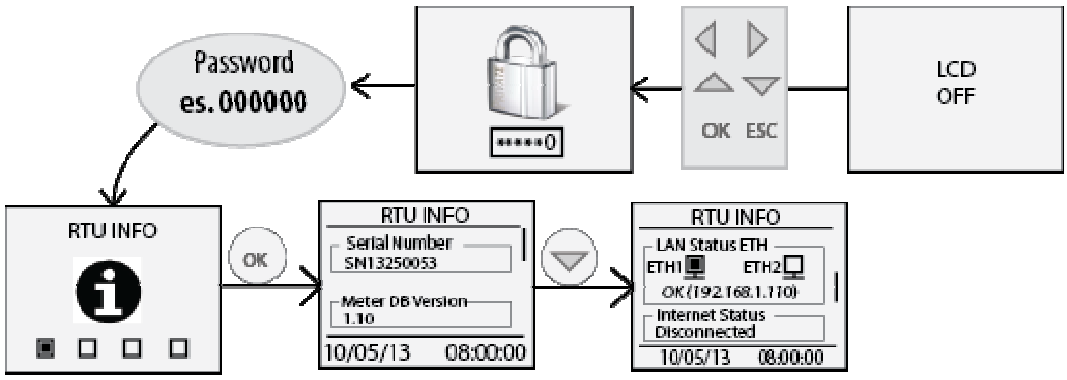


Figure 6 - LAN configuration

The default RTU network settings are:

- IP address: **192.168.1.110**
- Netmask: **255.255.255.0**
- IP allocation: **Static**

- Configure the PC network interface with an IP address that belongs to the same subnet as the RTU. The example in the figure shows that, in order for the computer to communicate via Ethernet with the RTU, you must configure the IP address of the computer network adapter to which the RTU is connected:
- IP address: **192.168.1.XXX (With XXX being a number ranging between 1 and 254 and different than 110)**
- Netmask: **255.255.255.0**
- IP allocation: **Static**
- To change the IP address of the computer network adapter, refer to the user manual of the Operating System of your PC
- In the event that the PC and the RTU are connected via an existing LAN (company or domestic network), make sure not to allocate the IP address of the RTU or of the PC
- For instructions on how to change the IP address of your PC, refer to your current OS

5.5 Connection to a GPRS-UMTS modem/router

A data connection to access the Internet ensures remote consultation of the webserver, sending of consumption reports, and monitoring of the system. Should a LAN/ADSL connection not be available, you must use a modem/router supplied as an option of the RTU.

The default settings of the RTU and SIN.ROUTER allow the connection of the two devices without having to change their network parameters. The router is configured to use a TIM (Telecom Italia Mobile) SIM. In this case, the user must carry out the following operations:

- Power off the router.
- Remove the front panel where the place to insert the SIM is indicated
- Ensure that the SIM PIN is disabled
- Insert the data SIM in the right direction
- Close the front panel
- Fasten the two GSM MAIN and AUX antennas to ensure sufficient transmission signal
- Wait for the router to connect to the mobile network
- Use a network cable to connect port LAN1 of the router to port ETH1 or ETH2 of the RTU
- Verify that the Internet connection is OK from the display (section RTU INFO, Chapter 8.4)

Should a TIM SIM not be available, the operator will have to change some router settings:

- Verify whether it is a Machine-To-Machine (M2M) SIM
- It is enabled for GPRS/UMTS traffic
- Check with the operator that it is bidirectional. i.e. that it allows access to port 80 for webserver consultation
- Change the APN of the router with the one provided by the operator (e.g. ibox.tim.it / m2mbis.vodafone.it)

Refer to the Appendix (Chapter 20) for in-detail information on router settings

5.6 Connecting the digital inputs to voltage free contacts

Follow the instructions below to connect the digital inputs to the device with voltage free contacts, such as switches, interface relays, or anything else that does not require voltage:

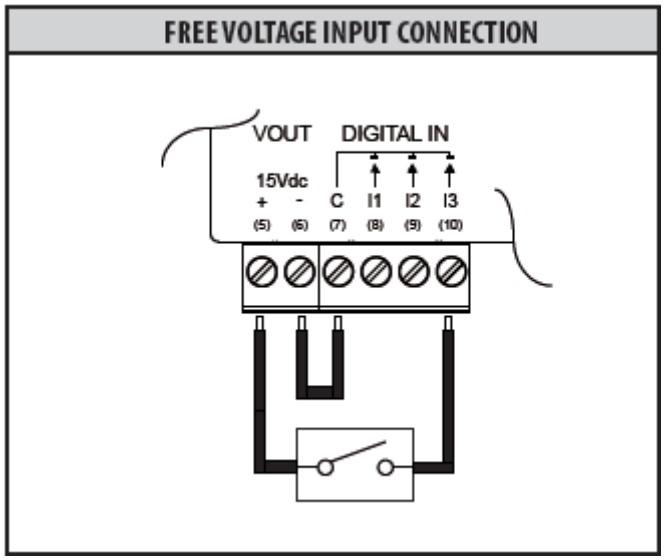


Figure 7 - Digital input connection

- Connect the digital input common (7) to the Vout terminal (6)
- Connect the Vout (+15Vdc) terminal (5) to one of the poles of the contact you want to connect
- Connect the other pole to the desired digital input: (8) for I1, (9) for I2 e (10) for I3

5.7 Connecting the digital inputs to positive voltage contacts

Follow the instructions below to connect the digital inputs to the device with positive voltage (in the event of closed contacts) and voltage free contacts (in the event of open contact):

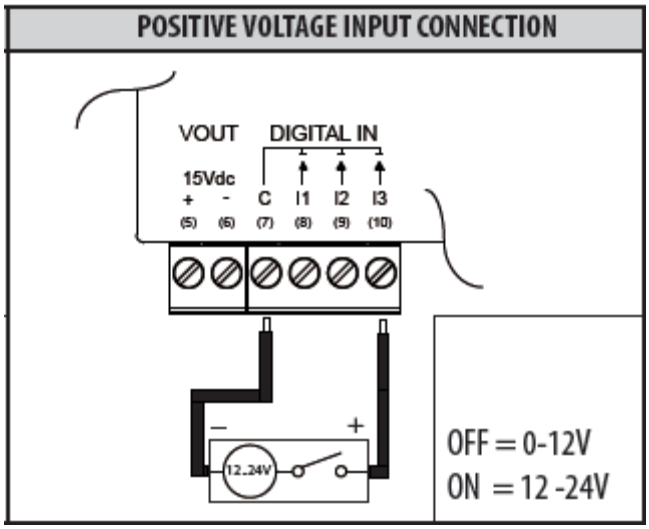


Figure 8 - Positive voltage digital input connection

- Connect the common pole (negative) of the contact to the common terminal (7) of the device
- Connect the positive pole of the contact to terminal (8)/(9)/(10) for inputs I1/I2/I3

When the voltage at the ends of the connected input – for example between (7) and (10) – ranges between 0V and 12V, the RTU input is considered open (OFF). When the voltage value ranges between 12V and 24V, it is considered closed (ON).

5.8 Connecting the digital inputs to negative voltage contacts

Follow the instructions below to connect the digital inputs to the device with negative voltage (in the event of closed contacts) and voltage free contacts (in the event of open contact):

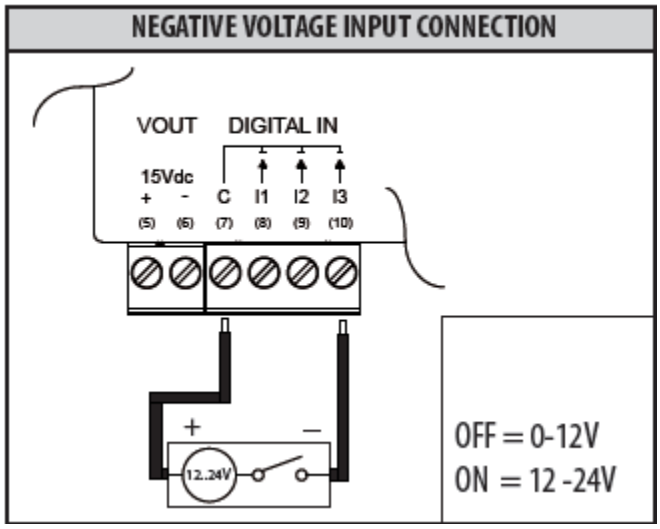


Figure 9 - Negative voltage digital input connection

- Connect the common pole (positive) of the contact to the common terminal (7) of the device
- Connect the negative pole of the contact to terminal (8)/(9)/(10) for inputs I1/I2/I3

When the voltage at the ends of the connected input – for example between (7) and (10) – ranges between 0V and 12V, the RTU input is considered open (OFF). When the voltage value ranges between 12V and 24V, it is considered closed (ON).

5.9 Digital output connection

The RTU is equipped with two relays that can be used as digital outputs. You can connect a load to them or use them to activate other systems. Outputs O1 and O2 can be controlled both remotely and via web server (Ref. Chapter 15). As for the connection to connection to electrical resistive loads, do not exceed the maximum absorption (5A) and maximum voltage (230Vac).

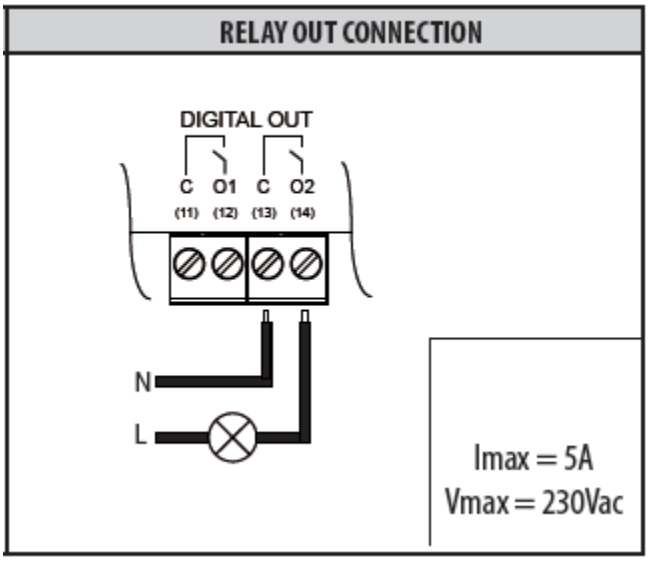
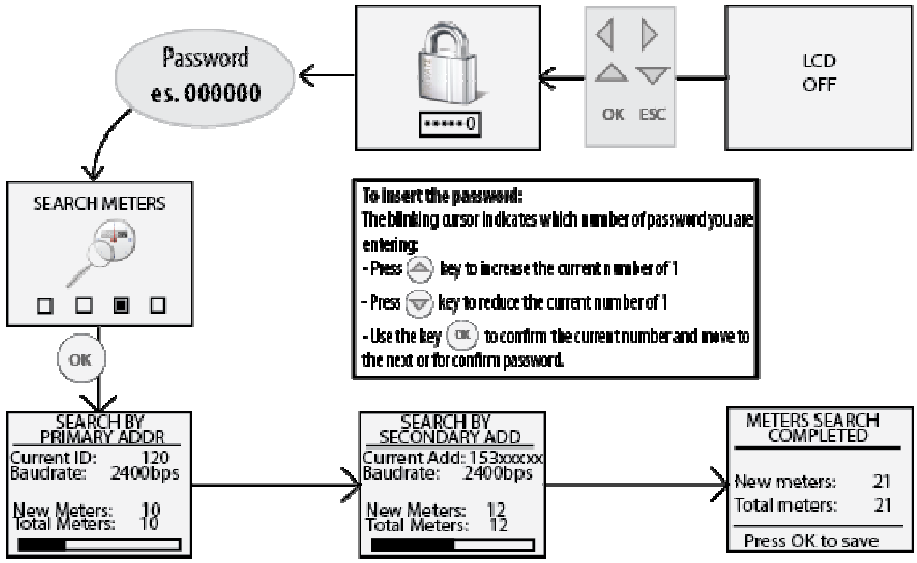
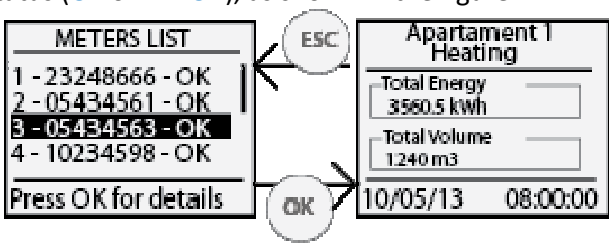


Figure 10 - Digital output connection

6. COMMISSIONING

Commissioning includes all the activities that allow full operation of the RTU connected to the M-Bus system.

Upon completing the installation and verifying that all the connections have been made properly, the system can be commissioned following the instructions below:

1 **Verify M-Bus** **(REQUIRED)**	Ensure that the M-bus Ready LED lights up on the LC (SIN.EQLC1) and the M-bus error LED is off. Use a multimeter to verify that the voltage at terminals (6) and (7) of the LC (SIN.EQLC1) ranges between 24Vdc and 42Vdc
2 **Start meter search** **(REQUIRED)**	Start the meter search by clicking on OK on the SEARCH icon: 
3 **Verify Meters** **(REQUIRED)**	Once the search is complete, the list of meters is displayed together with the communication status (OK or ERROR), as shown in the figure:  Press OK in correspondence of a meter to access the latest readout performed.
4 **Access to Webserver** **(RECOMMENDED)**	After scanning the bus, we recommend accessing the RTU's webserver (see Chapter 10) to complete the configuration, adding the plant database and allocating the meters and settings to send the reports. • Use a network cable to connect the RTU to the computer, as described in Chapter 4.4 • Open your web browser, such as Chrome, Safari, Firefox (We recommend Google Chrome)

	• Type in the RTU's IP address, indicated on the display, in the address bar, as described in Chapter 4.4 (e.g. 192.168.1.110) and press "Enter"
5 **Meter name allocation (RECOMMENDED)**	To ensure easy consultation of the consumption through the reports or on the RTU display, the user should assign at least a Device Name to identify a meter with its utility, for example Apartment 1 or Apartment 12. • See Chapter 15 allocate the name and add the description of the meters
6 **Plant Database (RECOMMENDED)**	The plant database includes information on the property and location of the plant These are shown in the heading of the reports generated by the datalogger. • See Chapter 11 to set the plant database
7 **Email settings (RECOMMENDED)**	To allow the datalogger to notify reports/events or anomalies/errors in a plant, we recommend setting the Email section carefully. • See Chapter 12.3 for the email settings
8 **Display/Webserver password changes (HIGHLY RECOMMENDED)**	Before completing the commissioning stage, we highly recommend changing the default password to access the display and webserver. • See Chapter 18 for instructions to change the password to access the display • See Chapter 18 for instructions to change the password to access the webserver

7. SELECTING THE LANGUAGE

You can select the language directly from the RTU or via the Web.

In the former case, upon entering the password in the main menus, such as RTU INFO, METERS, SEARCH, and SETTINGS, all you have to do is press the arrows ⏶ or ⏷ to change the language. The available languages are English and Italian

Refer to Chapter 11.1 for instructions to change the language via the Web.

8. BUTTONS AND DISPLAY

8.1 Button description

The RTU is equipped with 6 navigation buttons, which allow browsing through the menus on the display. The functions of the buttons may change according to the context of the displayed menu; in general, we can summarise them as follows:

OK	Button to confirm field and value changes Button to access the submenus
ESC	Button to cancel field and value changes Button to exit the submenus
	Left: for main menu / data cursor
	Right: for main menu / data cursor
	UP: To scroll pages up Change/add letters from A to Z or numbers from 0 to 9 Changes the language between Italian and English in the RTU INFO, METERS, SEARCH, and SETTINGS menus
	Down: To scroll pages down Change/add letters from A to Z or numbers from 0 to 9 Changes the language between Italian and English in the RTU INFO, METERS, SEARCH, and SETTINGS menus

8.2 Display

The RTU is equipped with a 96x128 pixel resolution OLED display (16-level greyscale), which allows the consultation of the readouts and basic settings of the RTU. To minimise electricity consumption, the display turns off automatically after 10 minutes of inactivity. To turn it on again, simply press one of the navigation buttons.

8.3 Display – Main menu

To access the main menu when the display is off, press any button and the screen to enter the LCD password will be displayed. Enter the password (default:000000) using the UP and DOWN buttons to set the number between 0 and 9 on the position indicated by the blinking cursor; press OK to confirm the current position and proceed to the next one, until all the six numbers are entered.

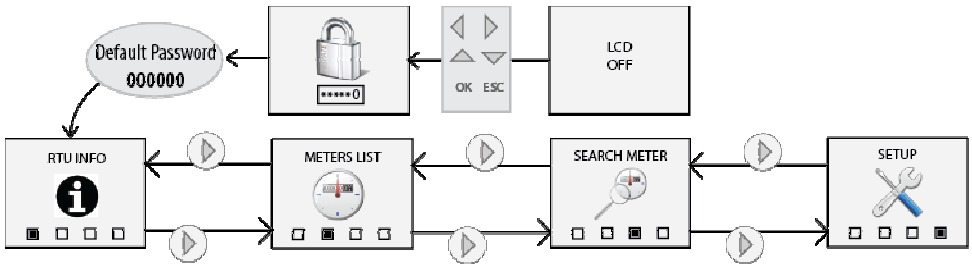


Figure 11 - Display navigation

If you enter the correct password, the main menu, consisting of 4 pages, will be displayed:

- RTU INFO: summarises all the information pertaining to the RTU (see Par. 6.4)
- METERS: shows the list of all the meters and allows access to the readout (see Par. 6.5)
- SEARCH: starts searching the meters according to the last settings saved (see Par 6.6)
- SETTINGS: allows access to the "settings" menu, through which you can change the main RTU parameters (see Par. 6.7)

8.4 Display – RTU INFO

Press OK in the RTU INFO menu to access the submenu that displays the network parameters as shown in the figure:

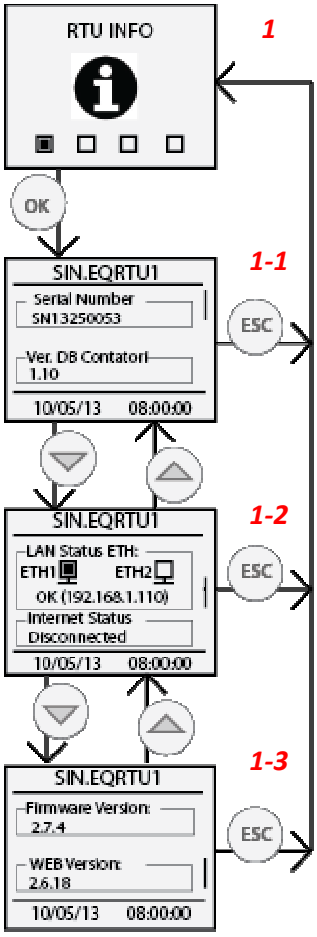


Figure 12 - RTU INFO

Each page, **1-1**, **1-2**, and **1-3** shows the model of the device and the current date and time. As for the content of the single sections, we have:

- ***1-1***
  - *Serial Number*: Shows the serial number to be indicated in the event of technical support
  - *Meter DB Ver.;* Shows the version of the meter database installed in the datalogger
- ***1-2***
  - *LAN ETH status:* Indicates the connection status of Ethernet ports ETH1 and ETH2. In the event at least one of the two ports is connected, it shows the IP address of the network interface

- *Internet status:* Indicates whether the RTU can connect to the Internet or not. If an Internet connection is available, the public IP address, with which the RTU can be viewed remotely, is displayed

- ***1-3***
  - *Firmware version:* Indicates the current firmware
  - *WEB version:* indicates the current version of the web interface

8.5 Display - METERS

Press OK in the METERS menu to access the submenu that allows you to view the list of all the meters and the latest readout performed. The following figure shows the possible steps that can be taken in the METERS menu:

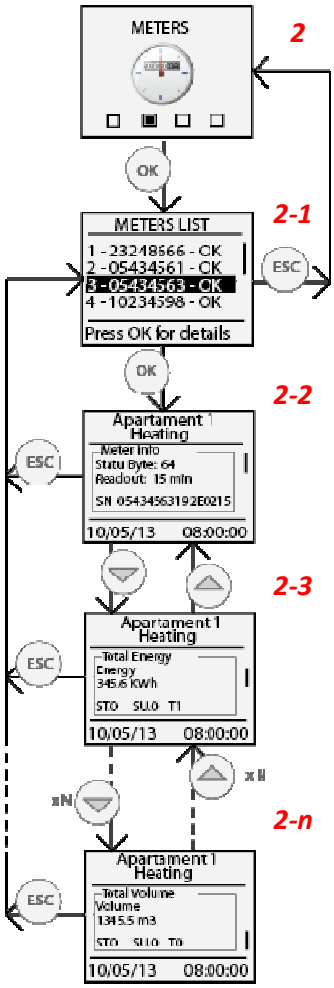


Figure 13 - Meters display

- ***2-1***: shows the list of the previously saved meters identified with the first 8 numbers of the meter's serial number (e.g. 05434563). The communication status of every meter is shown indicating OK if the last readout was carried out correctly or ERROR in the event of a communication error during the last readout
- Use navigation buttons UP and DOWN to scroll through the list of all the meters, highlighting the one you want to select to access the values of the last readout
- ***2-2***: press OK in correspondence of a meter in the list to view the values of the last readout (if any). The first frame, indicated in Figure 14, is common to all three meters, as it is a summary of the main

information pertaining to the meter, such as the M-bus status byte value, meter readout value, and the full serial number. If the M-Bus status byte is different from zero, it indicates possible meter anomalies. In the event that a meter is included in the datalogger database, you can identify an anomaly by accessing the webserver and consulting the Devices page in the Settings menu. In the event that the meter is not included in the datalogger database, refer to the meter user guide to identify the anomaly corresponding to the number indicated in the M-Bus status Byte

- ***2-3/2-n***: use navigation buttons UP and DOWN to consult the value of the meter fields pertaining to the date and time of the readout. For every field, the following information is shown:

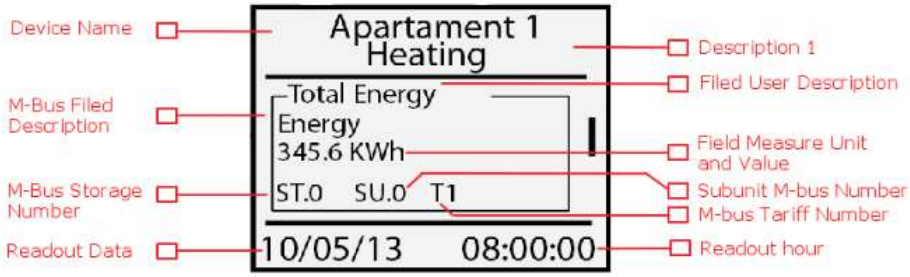


Figure 14 - Meter data readout

Carefully read the following notes

The display shows only the meter fields where the "**Display Data**" option is active in the "***Meter Data Setup***" section of the "***Devices***" page in the "***Settings***" menu (see Par. 15)

- *Device Name:* Shows the reference of the meter specified in the Device Name in the Devices page in the Settings menu. Refer to Chapter 15 to change the meter reference
- *Description 1:* Shows the value entered in *Description 1* in the Devices page in the Settings menu. Refer to Chapter 15 to change the meter reference
- *Field User Description:* Indicates the detailed description of the displayed field entered by the user or included in the meter database
- *Field M-Bus Description:* Shows the field description as defined in the M-Bus protocol.
- *Field value and measurement unit*: Indicates the value and measurement unit of the field displayed with reference to the readout being viewed
- *M-bus Storage Number:* Indicates the Storage Number of the displayed field. Refer to the meter manual guide for further information
- *M-bus Subunit Number:* Indicates the Subunit Number of the displayed field. Refer to the meter manual guide for further information
- *M-bus Tariff Number:* Indicates the Tariff Number of the displayed field. Refer to the meter manual guide for further information
- *Readout Date:* Indicates the date of the readout being viewed
- *Readout Time:* Indicates the time of the readout being viewed

8.6 Display - SETTINGS

The Display Settings section is divided into four subsections

- ***General***
- ***M-Bus***
- ***Network***
- ***Password***

Refer to Chapter 8 (Buttons and Display) and to Figure 15 to consult the various items.

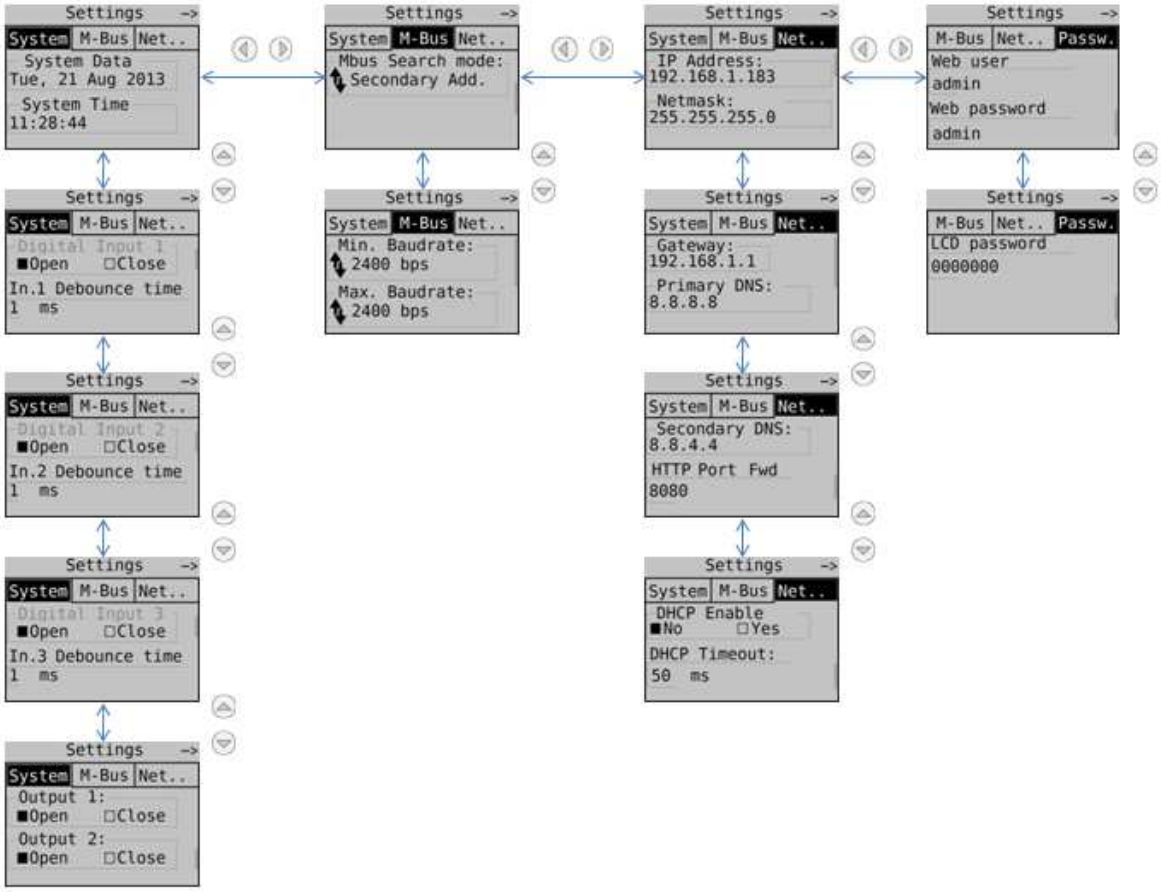


Figure 15 - SETTINGS structure

Press OK for every field reached via the navigation buttons to select the fields to be modified and then press OK again to change the values to enter using the navigation arrows, as shown in Chapter 8.

8.7 Display – METER SEARCH

Press OK in correspondence of the SEARCH METERS icon to start scanning the bus and acquire the connected meters. The search settings are those that have been previously saved as shown in Chapter 6.

The default search settings are:

- Transmission rate: 2400bps
- Type of search: Primary ID + Secondary ID
- Primary ID scanning interval 1-250

The figure below shows a typical bus scan with the default settings indicated above:

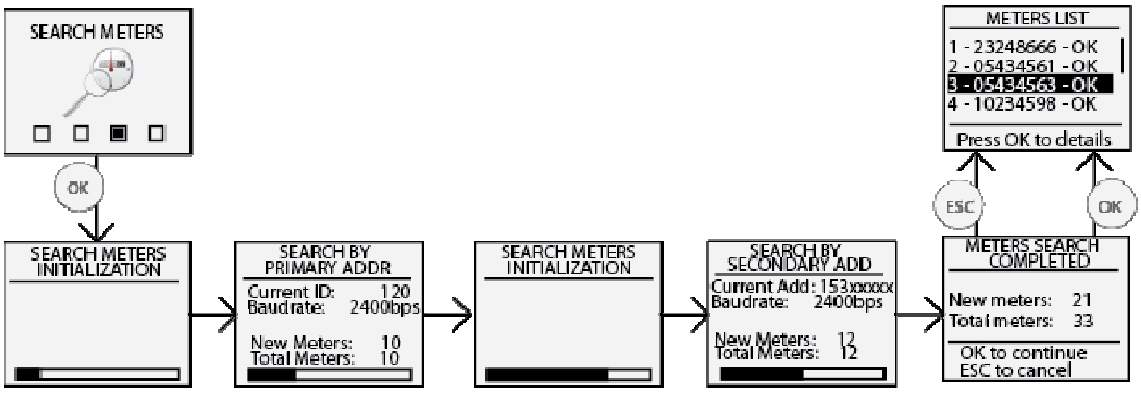


Figure 16 - Searching meters

Upon completing the meter search, second last block, press OK to save all the meters found; otherwise, press ESC if you do not want to save any of the meters found. Refer to the WEB section (Chapter 15.1, 15.2) to change or complete the settings of the meters found in this section.

9. CONNECTING THE RTU TO THE PC

Connect the RTU either to ETH1 or ETH2 using a T568A or T568B (straight through or crossover) Ethernet cable as shown in Figure 17

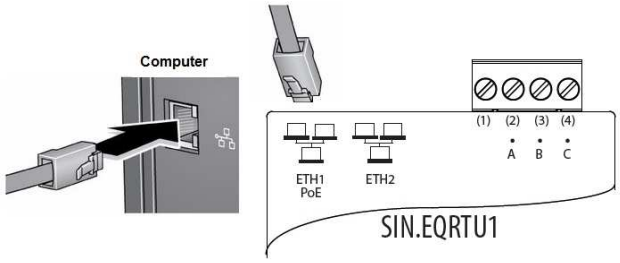


Figure 17 - LAN connection

Set the network adapter of your PC in such a way as to allow communication between the two devices. Below is a description of a possible configuration of the LAN between the two devices in the event that the RTU IP address has not been changed, as shown in Chapter 5.4**,** 8.4

Carefully read the following notes

In order for the RTU and PC to communicate, the two devices must have an IP address within the same subnet.

The default RTU network settings are:

- IP address: **192.168.1.110**
- Netmask: **255.255.255.0**
- IP allocation: **Static**

In order for the computer to communicate with the RTU via Ethernet, the IP address of the computer's network adapter must be set as follows:

- IP address: **192.168.1.XXX (With XXX being a number ranging between 1 and 254 and different than 110)**
- Netmask: **255.255.255.0**
- IP allocation: **Static**

To change the IP address of your computer' network adapter, refer to its Operating System user guide.

In the event that the PC and the RTU are connected via an existing LAN (company or domestic network), make sure not to allocate the IP address of the RTU or of the PC.

In the event that the default IP address of the RTU has been changed, you can consult the current IP address as described in Chapters 5.4**,** 8.4.

10. Homepage

Connect the device as shown in Figure 17 and type in the address 192.168.1.110 in your browser

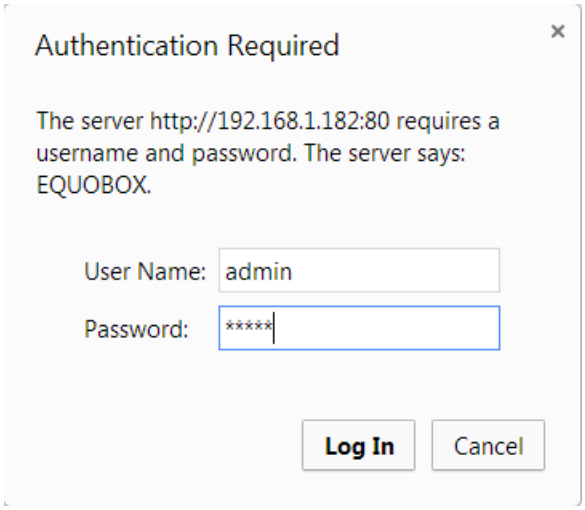


Figure 18 - Login

The data for the first access are:

- User Name: admin
- Password: admin

Press Login to access the Homepage appears as shown in the figure:

Figure 19 - Homepage

The screen is divided into three sections:

1	• Path of the page being consulted • Type of user connected • Selected language (Italian or English) • Link to download the installation file in .rar format

2	• Plant status
	  o Display status
	• Settings
	  o Plant
	  o Network
	  o Devices
	  o Events
	• Export Data
	  o Create Report
	  o Planning
	  o Report Archive
	• User Account
	  o Login

3	Shows the submenu with the items pertaining to the main menu (Section 2)

11. Settings – System

The items that can be selected are:

- Settings
  - Plant Database
  - System settings
  - Maintenance
- Network
  - General Setup
  - Advanced Setup
  - Email Setup
  - DynDNS
- Devices
  - Meter Setup
  - Search Setup
- Events

11.1 Plant Database

You can add only one plant for every RTU

Figure 20 - Plant data settings

Enter the plant data:

- Plant Name: enter the name of the plant
- Plant Address: enter the address of the plant
- Installer name: enter the name of the installer
- Customer Name: enter the name of the client
- Installation Date: if not entered, the RTU will enter the current date by default

11.2 System settings

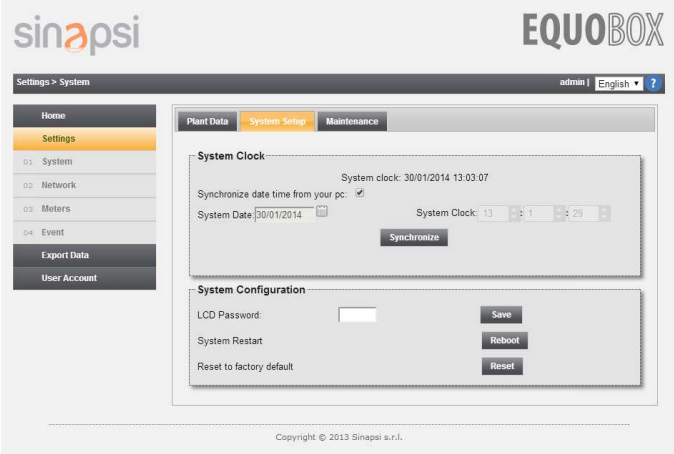


Figure 21 - System settings

The System Settings screen has two sections:

1. Date and Time: choose between the manual and automatic setting for the date and time, synchronising them with your PC
2. System configuration:
    - LCD Password: allows changing the password to access the controls on the device display. The default password is 000000
    - System Resart: allows you to restart the RTU
    - Reset to factory default: allows you to initialise the device according to the default settings

11.3 Maintenance

This page allows you to update and/or restore the RTU

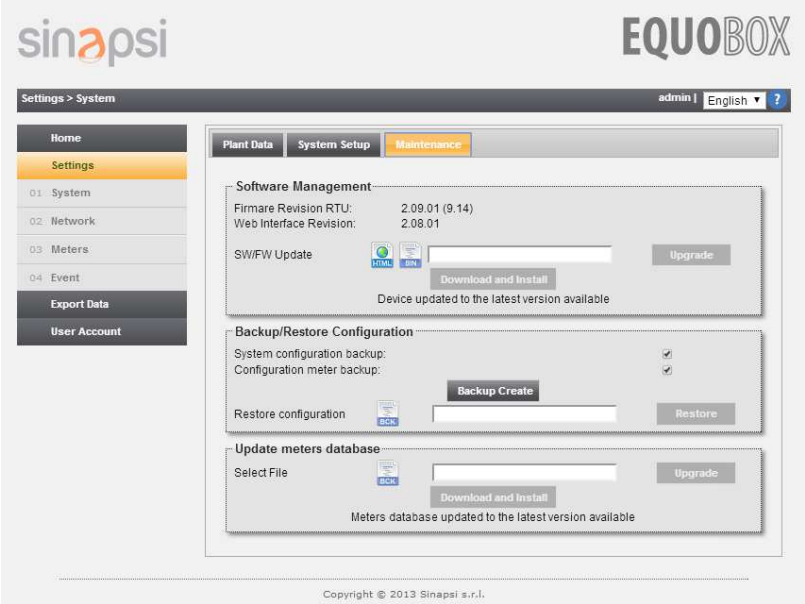


Figure 22 - Service Settings

The Service screen consists of:

1. Software update
   - RTU Firmware Version: shows the RTU's current firmware version
   - Web Interface Version: shows the RTU's current web interface version
   - SSW/FW Update: allows for manual or automatic online update. This update will involve both the software and the web interface; the name of the update is equobox_rtu.bin

   WE RECOMMEND REFRESHING THE PAGE TO PREVENT ERRORS AFTER AN UPDATE. SHOULD THIS NOT BE ENOUGH, CLEAR THE BROWSER'S CACHE.

2. Backup/Restore Configuration:
   - System Configuration Backup: select if you want to create a system backup. Press Create Backup to complete the operation
   - Meter Configuration Backup: select if you want to create a meter configuration backup. Press Create Backup to complete the operation
   - Restore Configuration: if you want to restore the configuration of the meters in the plant. This operation can only be carried out if you have the backup file saved as meter.bck.
3. Update meter database: allows you to update the RTU database. This operation can only be carried out if you have the update file.

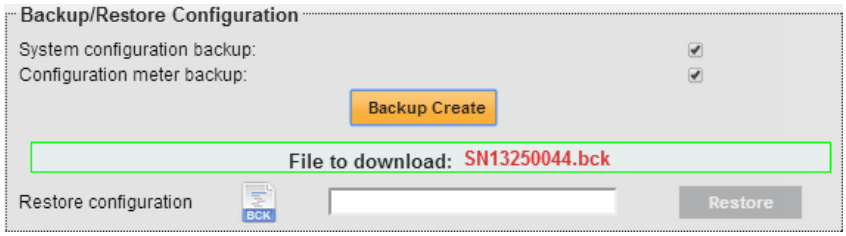


Figure 23 - Creating a backup

12. Settings – Network

12.1 General Setup

This section is dedicated to the RTU network settings

Figure 24 - Network settings

The fields to be filled out are:

- MAC Address: shows the RTU's MAC-Address
- Enable DHCP: select if you want to use the DHCP protocol
- IP Address: sets the machine's static LAN address
- Gateway address: sets the address of the LAN Gateway
- Network Mask: sets the LAN subnet mask
- Primary DNS: sets the primary DNS address
- Secondary DNS: sets the secondary DNS address

Pay particular attention to additions/changes. Always ask the company or domestic network administrator for information on the LAN class and on the data for a correct configuration.

12.2 Advanced Setup

This section is dedicated to the advanced parameters for the RTU system configuration. The parameters shown in Figure 25 should be managed by qualified personnel.

Figure 25 - Advanced network settings

The fields to fill out in this section are:

- HTTP Portforward: defines the external HTTP port if configured differently from 80, to ensure that emails are sent correctly. See Figure 26
- DHCP TimeOut: enter a timeout beyond which, the destination will be declared unreachable
- SNPDS hostname: enter, if used, the remote address of the SNPDS service
- CPU TCP Port: enter, if used, the communication port of the SIN.EQCPU unit

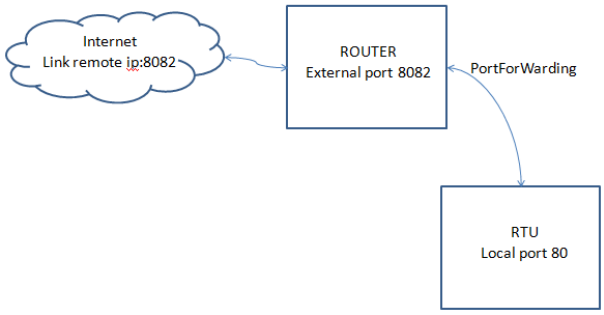


Figure 26 - Network infrastructure

12.3 Email Setup

This section allows you to configure the email management parameters in the RTU

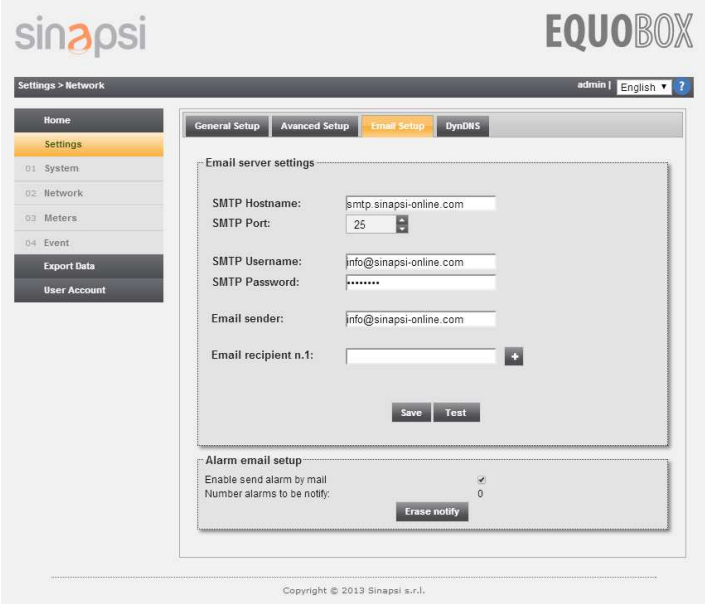


Figure 27 - Email settings

The page is divided into:

1. Email server settings
    - SMTP Hostname: enter the address of the SMTP server you want to use
    - SMTP Port: set the communication port for the SMTP server
        - Port 25 for unencrypted communication
        - Port 465 for encrypted communication
    - SMTP Username: enter the username to access the SMTP server
    - SMTP password: enter the password to access the SMTP server
    - Email Sender: enter an email address to define the sender
    - Email Recipient n.1: enter the recipients of the email. Do not add more than 4 recipient addresses

    Press Save to save the configuration. Press Test to verify whether the entered parameters are operating properly; if not, refer to Chapter 12.2

2. Alarm Email management
    - Enable alarm email notification: enables the RTU to send alarm email notifications
    - Number of alarms waiting to for notification: shows the number of alarms waiting to be notified. Press Delete pending notifications to delete the alarms that are yet to be notified by the RTU and verify the network and email management configurations

12.4 DynDNS

This section is dedicated to the configuration/activation of the DynDNS service

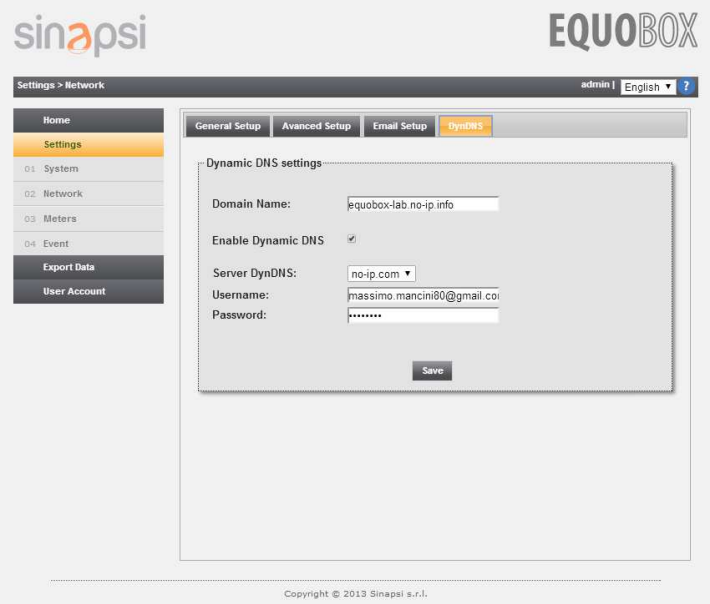


Figure 28 - DNS service settings

Enter:

- Domain Name: Enter the domain name provided by the no-ip.com service
- Enable Dynamic DNS: allows you to enable Dynamic DNS service
- Server DynDNS: select the server used to manage the dynamic address. Currently only no-ip.com
- Username: Enter the username to access the DynDNS service
- Password: Enter the password to access the DynDNS service

Press Save to save the configuration

13. Data sampling

13.1 Defining sampling frequency and RAW data

This section analyses how the RTU samples the values Figure 29 shows a curve sampled with $F_C = 1/T_C$ equal to one hour throughout the entire day. The RTU manages five sampling periods, which are:

- 15 minutes → 96 samples
- 1 hour→ 24 samples (Figure 29)
- 6 hours→ 4 samples
- 12 hours→ 2 samples
- 1 day → 1 sample

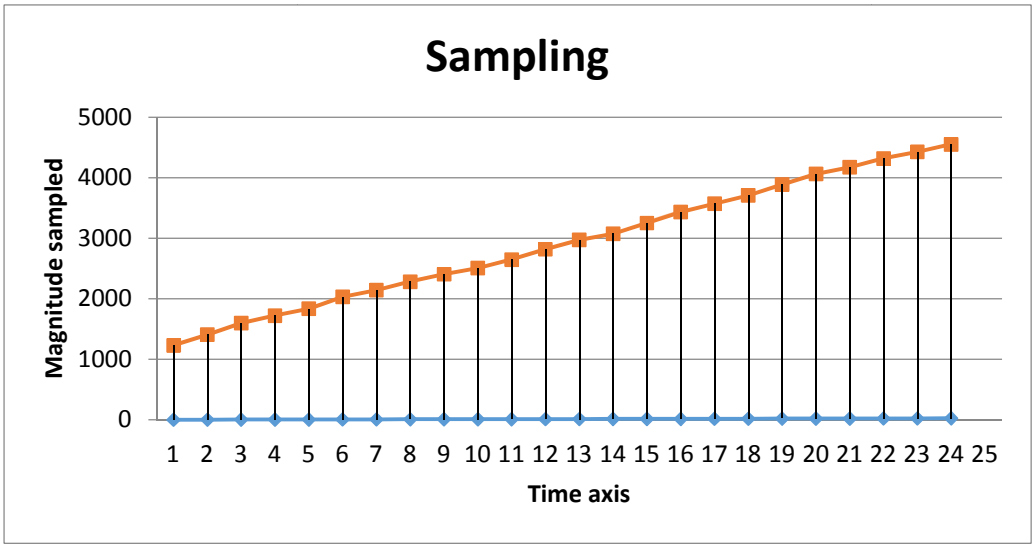


Figure 29 - Sampling

The samples stored in the RTU according to the sampling frequency are defined as RAW samples. ***RAW samples will always refer to the consulted day and you can store up to 96 samples for every day of the year for 250 devices. The samples of the previous year will be cyclically deleted from the RTU mass memory (Ref. Chapter 17.1).*** Pay special attention to the documentation of the devices before configuring the RTU sampling frequency. If the sampling value is too high, it can cause:

- no response from the devices in the field following the exhaustion of the possible responses from the unit.
- early device battery depletion compared to that declared in the datasheet

14. Defining summary data

The definition of Summary Data generated by the RTU is described in Figure 29. ***The RTU manages four types of summary data for up to 10 years for 250 devices.*** Regardless of the choice of the summary data during configuration, the RTU will generate all four summary values (15.2); this way, any data change will change the entire logfile of the data generated up to that moment. ***Changing any type of data involves regenerating all the data in the logfile of the data already generated in the RTU.*** The summary data are:

- None: no data displayed
- Consumption: generates data as the maximum value at the end of the day and corresponding delta
- Minimum: generates data as the minimum value of the day
- Maximum: generates data as the maximum value of the day

14.1 Summary Data – None

No summary data displayed in relation to the sampled data

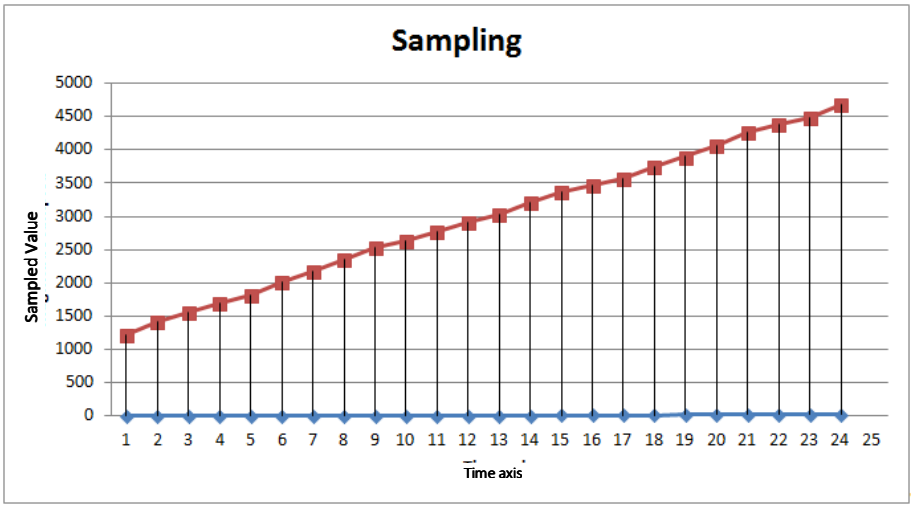


Figure 30 - Summary Data – None

14.2 Summary Data – Consumption

Summary data related to Consumption provide the maximum value logged during the day and the delta during the day

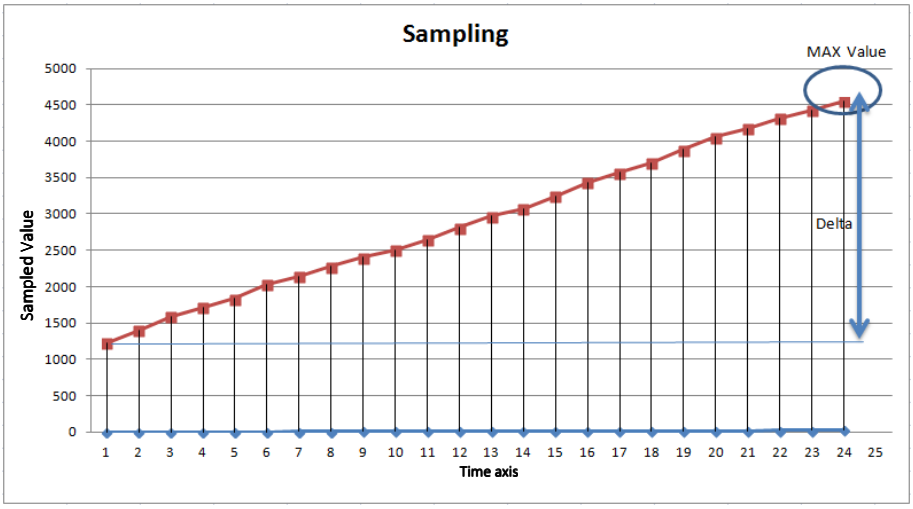


Figure 31 - Summary data - Consumption

14.3 Summary Data – Maximum

Summary data related to Maximum provide the maximum value logged during the day

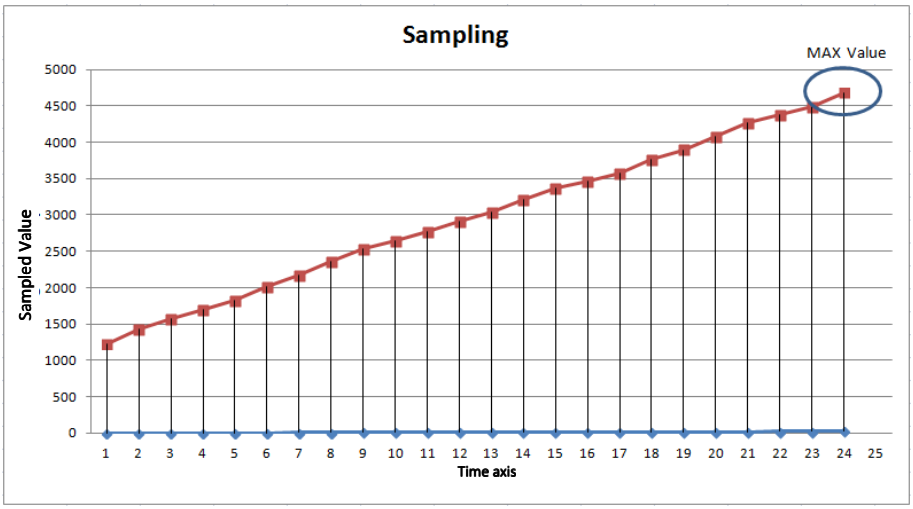


Figure 32 - Summary data – Maximum

14.4 Summary Data – Minimum

Summary data related to Minimum provide the minimum value logged during the day

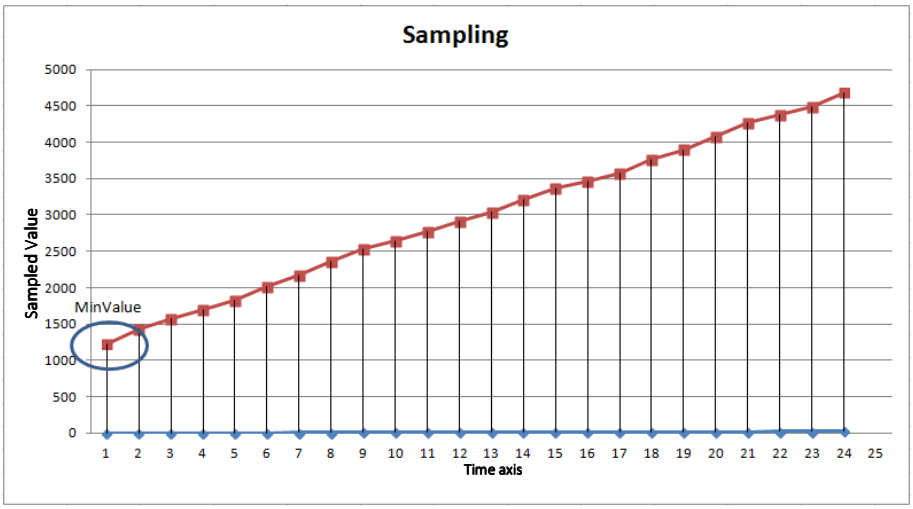


Figure 33 - Summary data - Minimum

15. Settings – Devices

This section allows you to configure/search the meters in the plant.

15.1 Search Setup

To search the meters go to Meters → Search Meter. This section provides two types of search: manual and automatic. We recommend opting for the automatic search. Use the manual search only in the event that one or more devices are not recognised by the automatic search. This can occur in the event of collisions during the automatic search, which prevents the devices in the field from being retrieved automatically or in the event of devices with a non-standard baudrate (always refer to the meter datasheet for this information)

Figure 34 - Meter setup

1. Automatic search
    - Uses default settings:
        - If selected, it searches the meter by Serial number and ID with Baudrate equal to 2400bps.
        - If not selected, you can choose among:
            - Search by Primary ID: select this item if you want to search the meters by primary ID
            - First Address to scan: enter the value to start the search
            - Second Address to scan: enter the value to end the search
            - Search by Secodary ID: select this item if you want to search the meters by secondary ID (serial number)
            - Baudrate Search: enter the search badurate
            - Press Start to start the search
2. Manual search: use this option only in the event that one or more devices are not recognised during the automatic search.
    - Use default settings: if selected, it automatically sets the baudrate to 2400; otherwise you can also select the baudrate for the search.
    - Baudrate Search: set the non-standard communication speed with which you want to query the devices that were not automatically recognised. Always refer to the meter datasheet to set the right non-standard baudrate.

Upon defining the transmission rate, press Start to start the search At this point, you can choose whether to set the search by primary ID (if set in the meter) or secondary ID (8-digit serial number of the meter). This type of search allows you to search one device at a time, as shown in Figure 34

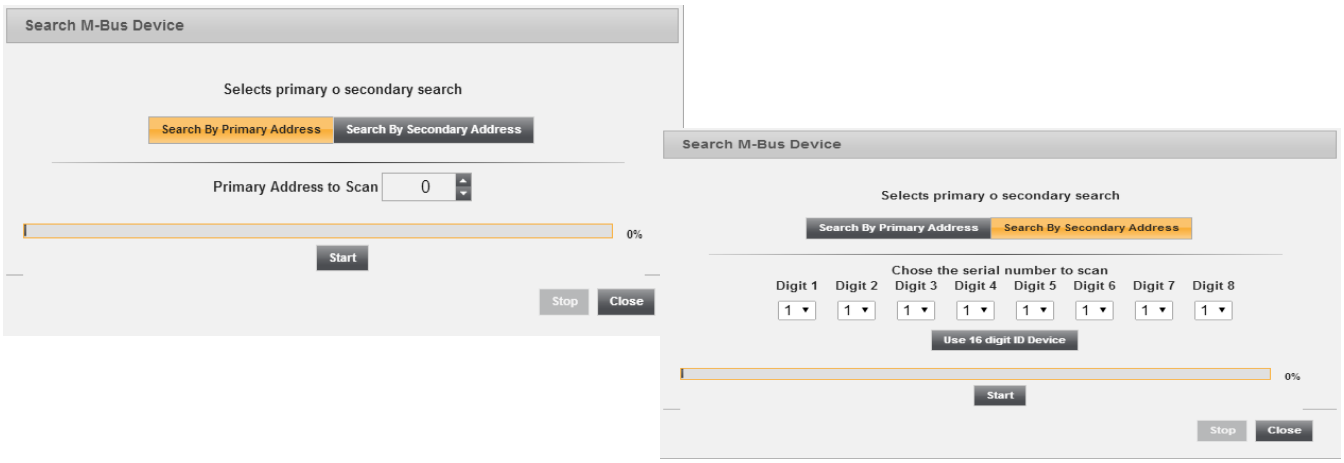


Figure 35 - Searching devices in manual mode

Upon starting the search, a window will appear, as shown in Figure 36. In this particular example, the devices were searched by primary address and two additional ones were found. You can interrupt the search at any time by pressing Stop.

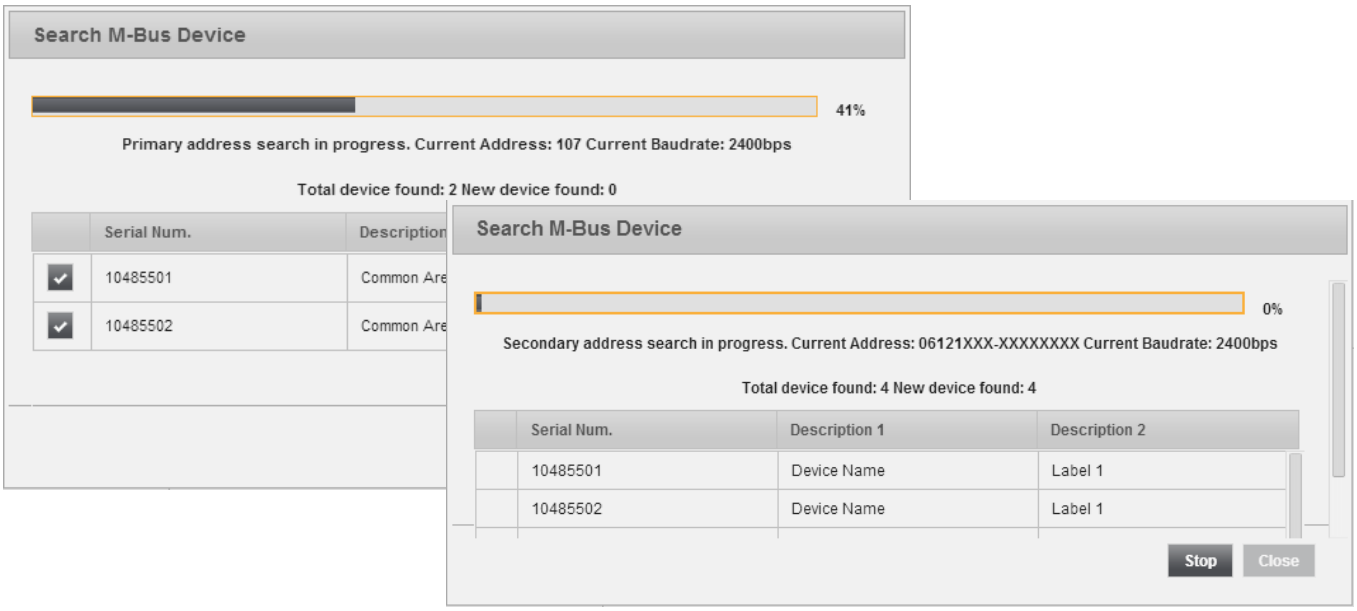


Figure 36 - Searching devices

At the end of the search, you can select the meters found. SeebFigure 37:

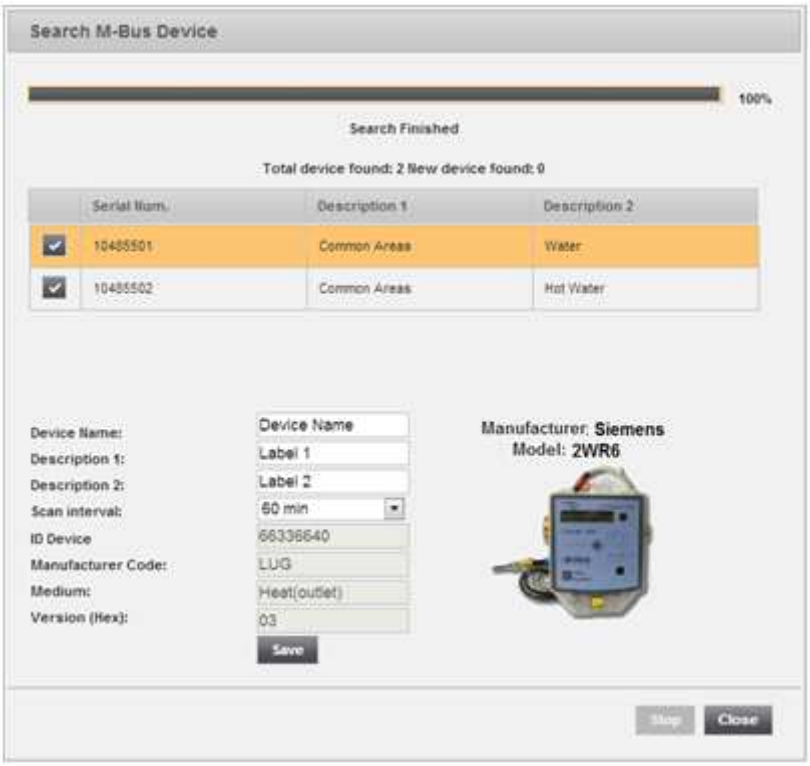


Figure 37 - Saving the meters

The following data will always be shown for every meter found:

- Serial number: shows the serial number of the selected meter
- Description 1: description of the meter
- Description 2: description of the meter

You can fill out the first four fields, such as:

- Device Name (modifiable): indicates the name of the device
- Description 1 (modifiable): if not already entered, add a first description to identify the meter
- Description 2 (modifiable): if not already entered, add a first description to identify the meter
- Readout interval (modifiable): interval with which readouts are performed: 15 minutes, 1 hour, 6 hours, 12 hours, 1 day. ***Refer to Chapter 13***
- ID Device: indicates the serial number of the selected meter
- Manufacturer Code: indicates the manufacturer's name in the event that the meter in the database is identified by the RTU.
- Measured value: indicates the type of value read by the meter
- Version (HEX): indicates the version of the meter.
- Manufacturer: indicates the manufacturer's name in the event that the meter in the database is identified by the RTU.
- Model: indicates the meter model in the event that the meter in the database is identified by the RTU.
- Press Save to add the meter.

To change the previously saved meters, access Meter setup, Chapter 15.2

15.2 Meter Setup

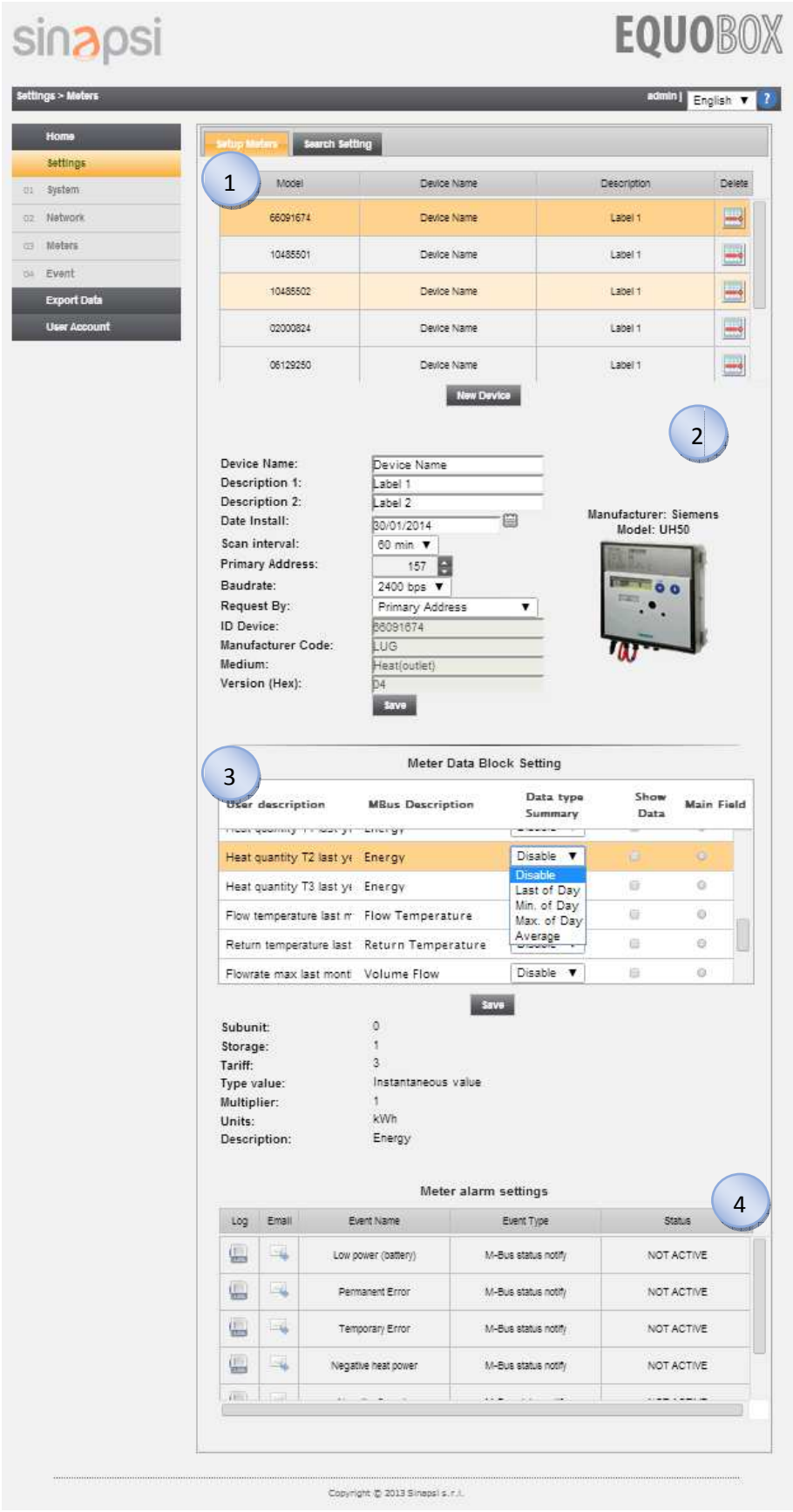


Figure 38 - Meter setup

The screen is divided as follows:

1. Meter table

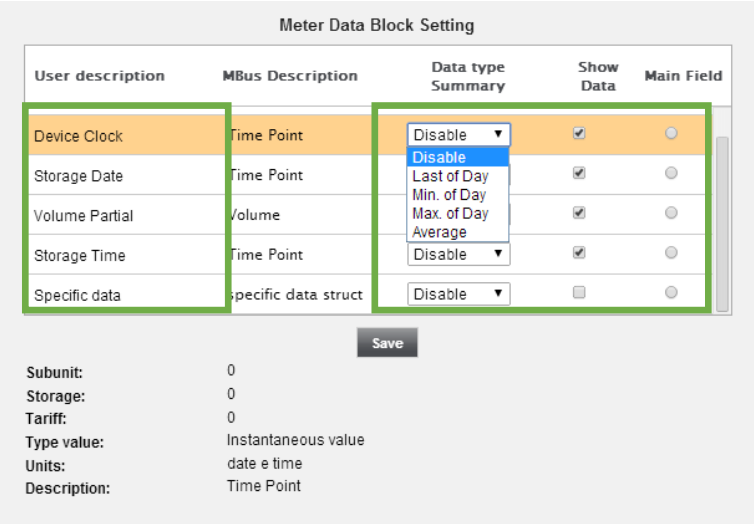
- Model: shows the serial number of the selected meter
- Device Name: name of the meter
- Description: refer to description1 of the meter
- Delete: click on the symbol to delete the meter

2. Meter data: the white cells are modifiable

- Device Name: indicates the name of the device
- Description 1: add a first description to identify the meter
- Description 2: add a first description to identify the meter
- Installation date: indicates when the meter was installed. This is set automatically upon saving the meter as described in the previous chapter.
- Readout interval: interval with which readouts are performed: 15 minutes, 1 hour, 6 hours, 12 hours, 1 day. ***Refer to Chapter 13***
- Primary Address: indicates the address of the meter. The addresses can range between 1 and 250 (not modifiable)
- Baudrate: Indicates the speed with which the meter communicates with the RTU. Check the meter manual to verify the communication speed.
- Request by: allows you to perform a readout by primary or secondary address
- ID device: indicates the serial number of the selected meter (not modifiable)
- Manufacturer Code: indicates the manufacturer's name in the event that the meter in the database is identified by the RTU (not modifiable)
- Measured value: indicates the type of value read by the meter (not modifiable)
- Version (HEX): indicates the version of the meter (not modifiable)

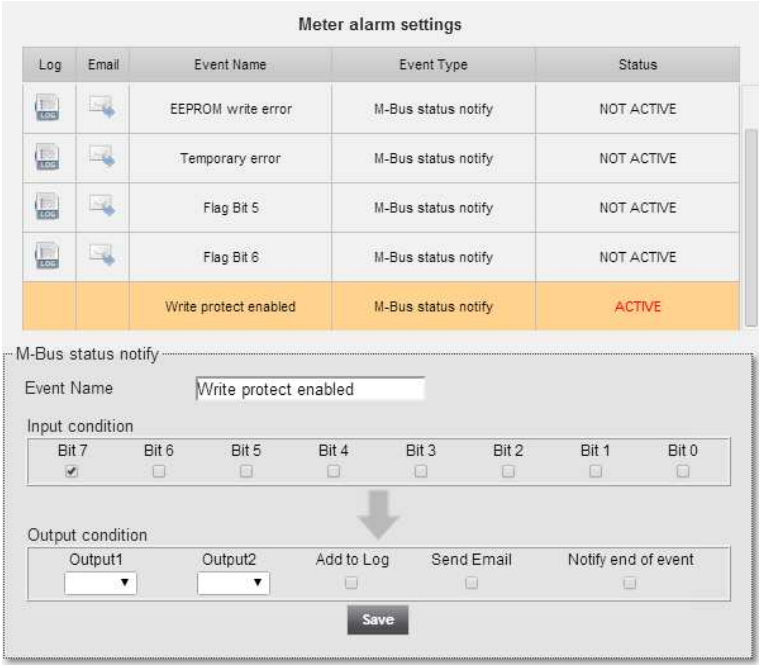
- Manufacturer: indicates the manufacturer's name in the event that the meter in the database is identified by the LC (not modifiable)
- Model: indicates the meter model in the event that the meter in the database is identified by the RTU (not modifiable)
- Save: to save any changes

3. Meter setup: the cells highlighted in green are modifiable

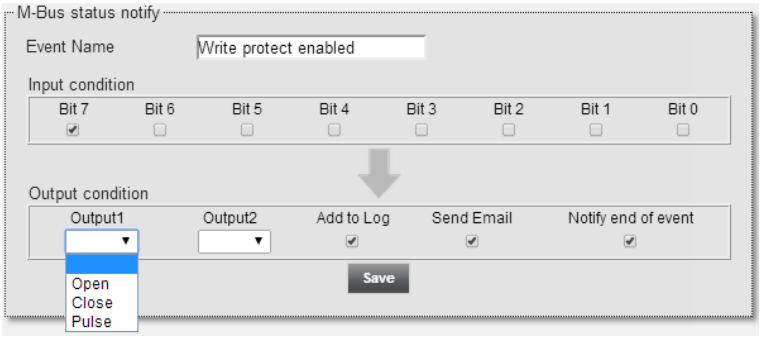


- User description: data coming from the device according to the modifiable protocol standard
- M-Bus description: data coming from the device according to the modifiable protocol standard
- Summary data: select the type of summary data to be calculated at the end of the day. ***Any changes to the summary data will change all the other data already stored in the RTU. Refer to Chapter 14*** You can select among:
  - Disable: no data displayed
  - Last of Day: generates data as the maximum value at the end of the day and corresponding daily delta
  - Min. of Day: generates data as the minimum value of the day
  - Max. Of Day: generates data as the maximum value of the day
  - Average: generates data as the average of the day
- Show data: select which data to include in the Homepage
- Main Field: this is the value you want to view immediately
- Save: to save any changes

4. Meter alarm settings: every meter has a series of errors that can be set individually. All the errors managed by the RTU are shown in the following table. For every error, you can set the configurations described below. By default, all the checkmarks are disabled for every alarm. See "Write Protect enabled", for example. Upon enabling the checkmarks the appearance will be as in the "Temporary Error" line.

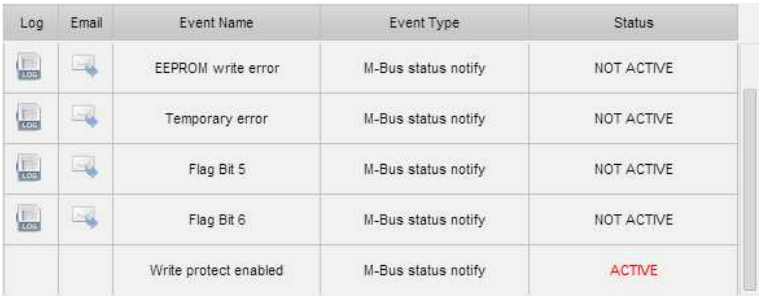


Press any alarm. In this case, "Write protect enabled". Every alarm will be displayed with the name of the event (modifiable) and the bit configuration for error identification (not modifiable). In the lower part, you can choose whether to enable the digital outputs or not when an event occurs (Ref. 5.9)



- Output 1: when an event occurs, you can enable an operation according to the device connected to Output 1, such as:
  - Open: commands to open
  - Close: commands to close
  - Pulse: generates a pulse
- Output 2: when an event occurs, you can enable an operation according to the device connected to Output 2, such as:
  - Open: commands to open
  - Close: commands to close
  - Pulse: generates a pulse
- Add to Log: stores the alarm in the meter's log
- Send Email: sends an email notification in the event of an alarm (Ref. Chapter 5.4, 8.4.)
- Event closure notification: sends an email notification when an event is closed.

Once the single events are solved, the table will display the following information



Log	Email	Event Name	Event Type	Status
		EEPROM write error	M-Bus status notify	NOT ACTIVE
		Temporary error	M-Bus status notify	NOT ACTIVE
		Flag Bit 5	M-Bus status notify	NOT ACTIVE
		Flag Bit 6	M-Bus status notify	NOT ACTIVE
		Write protect enabled	M-Bus status notify	ACTIVE

- Email: shows whether the event email notification is active
- Event name: shows the name of the event Data coming from the device according to the modifiable protocol standard
- Event type: shows the type of event. Data coming from the device according to the modifiable protocol standard
- Status: shows the alarm status (activated or deactivated). Data coming from the device according to the modifiable protocol standard
- Delete: deletes the selected alarm

16. Settings – Events

16.1 I/O Events

This section allows you to set up to four conditions to control the actuators. Ref. 5.9. With reference to that described in Chapter 5.9, the device is equipped with three digital inputs, I1, I2, and I3 and two digital outputs O1 and O2. Figure 39 shows an example of programmable logic.

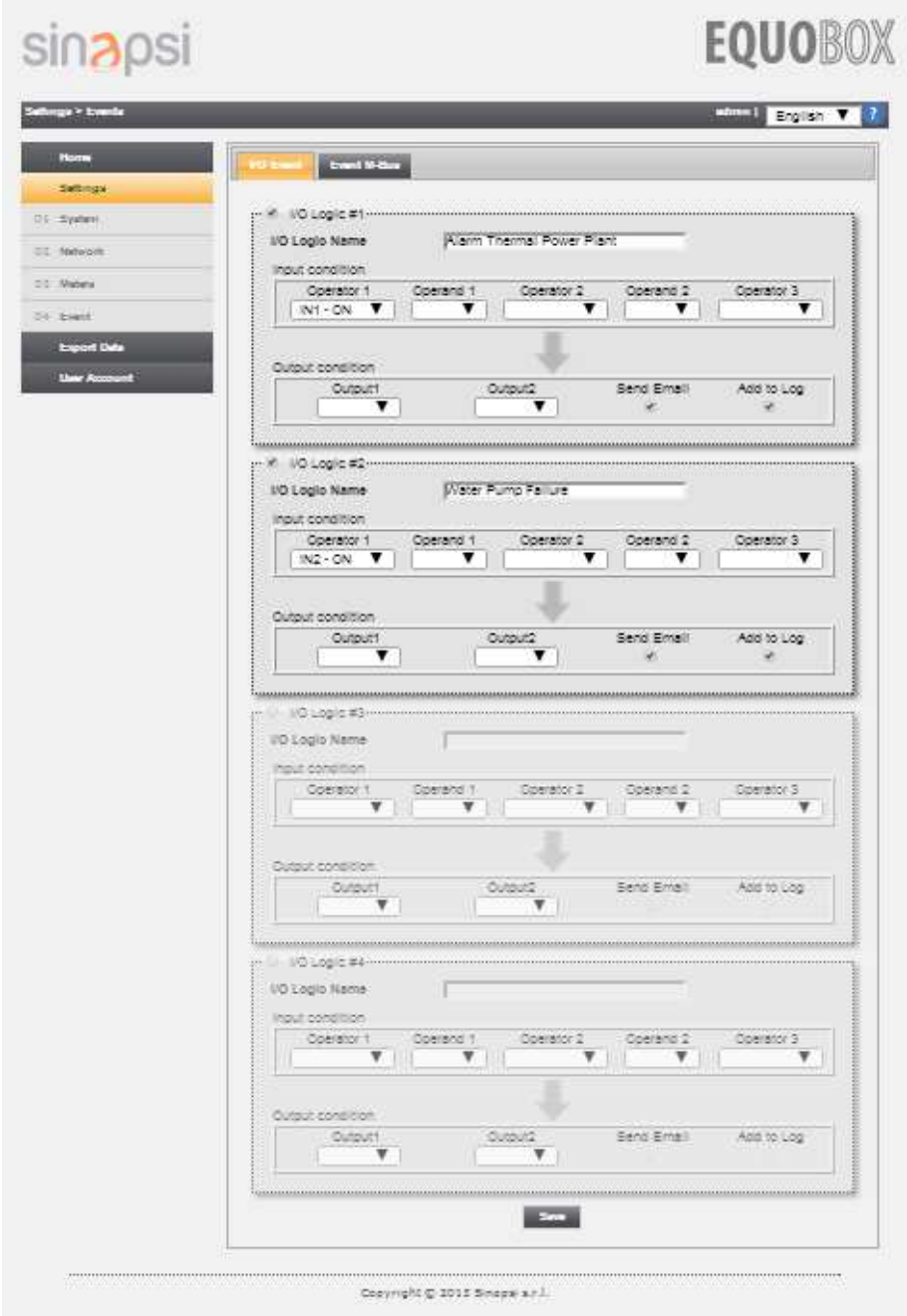


Figure 39 – Logic

Let's assume we want to set a logic, according to which O1 commands an opening and O2 sends a pulse. The logic is based on Boolean algebra.

(IN1=ON) AND (IN2=OFF) OR (IN3=OFF)

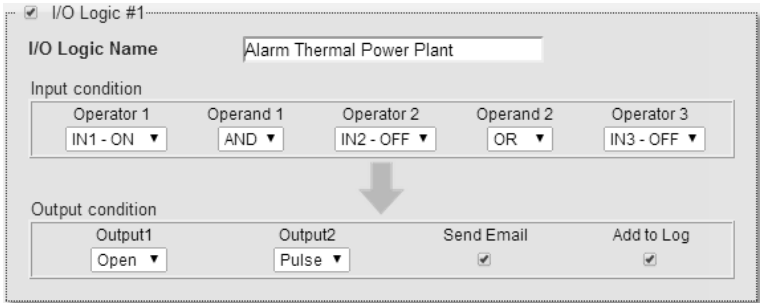


Figure 40 - Programming the logic

The logic settings allow you to select:

- Send email: sends an email to the recipients set in section 12.3
- Add to Log: adds the item to the Log after an event. See Chapter 19.2

Press Save to save the settings

16.2 M-bus events

This section allows you to set the conditions with data coming from the meters in the plant to control outputs O1 and O2. Press the "New Event" button, as shown in Figure 41 to generate a new event

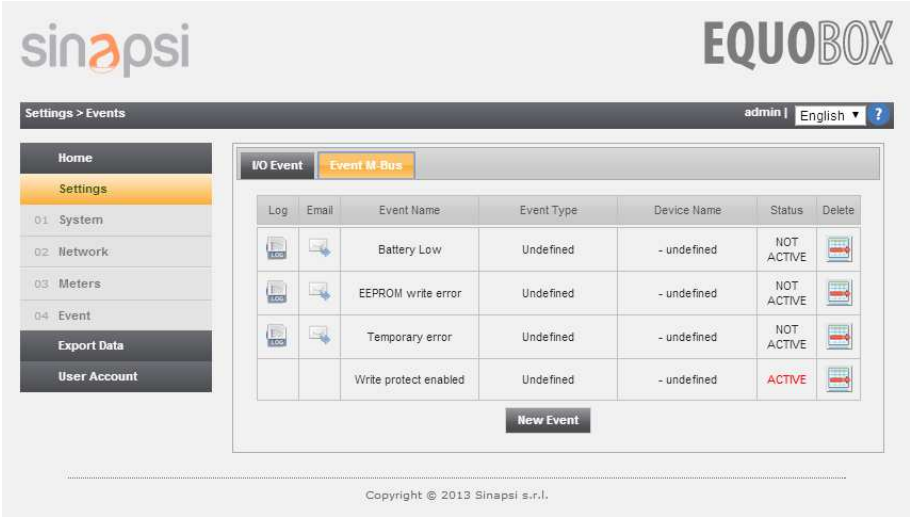


Figure 41 - Creating a new event

Select a meter from which you want to obtain data to set the event

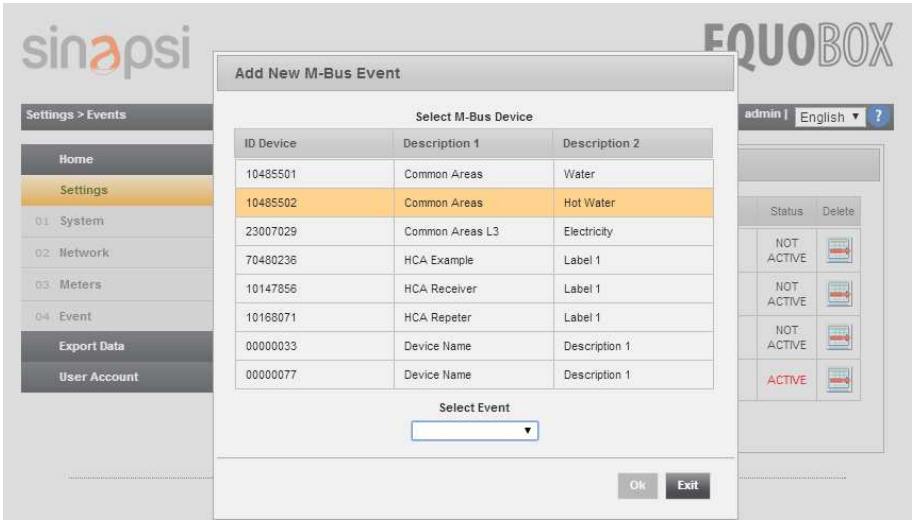


Figure 42 - Selecting a meter

Upon selecting the meter, specify the condition, among:

- Max Value: condition set according to the maximum value acquired by the data
- Min Value: condition set according to the minimum value acquired by the data
- Out of range: condition set according to the range acquired by the data
- M-bus status notify: condition set according to the creation of a new event. Always refer to the meter's documentation to activate this condition.

The next paragraphs will show in detail the parameters to configure the above.

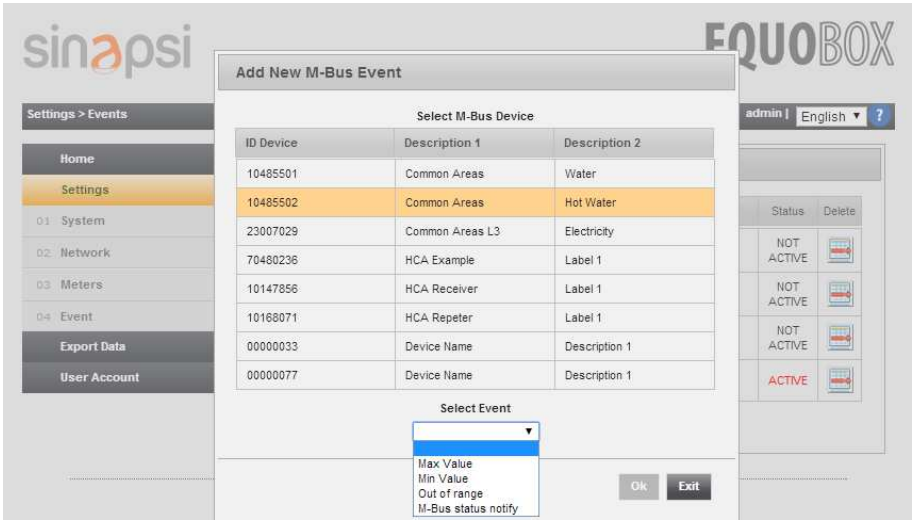


Figure 43 - Selecting an event

1.1.1 Condition set according to the maximum value acquired

Select Maxi Value.

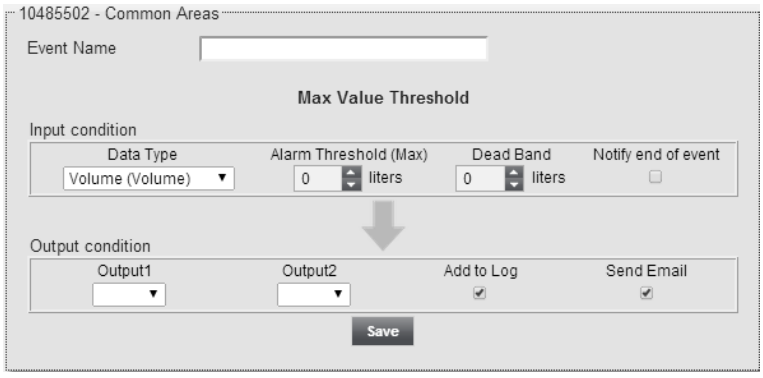


Figure 44 - Completing the creation of an event

The cells to be filled out are:

- Event Name: enter the name of the event being created
- Data Type: select the type of meter data. The data you can select are those that have already been set for every single meter. For more information, refer to Chapter 15.2
- Alarm threshold (Max): select an alarm threshold. The value can be both positive or negative
- Dead band: enter the value for which the condition does not occur. This feature allows the system to react with a certain delay to the actions to be taken based on the values measured beforehand

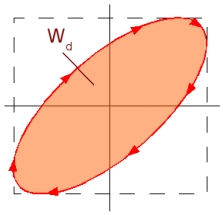


Figure 45 – Dead band

- Event closure notification: sends an email notification whenever an event is closed
- Output 1: when an event occurs, you can enable an operation according to the device connected to Output 1, such as:
    - Open: commands to open
    - Close: commands to close
    - Pulse: generates a pulse
- Output 2: when an event occurs, you can enable an operation according to the device connected to Output 2, such as:
    - Open: commands to open
    - Close: commands to close
    - Pulse: generates a pulse
- Add to Log: stores the alarm in the meter's log
- Send Email: sends an email notification in the event of an alarm (Ref. Chapter 5.4, 8.4.)
- Save: Press Save to save the configuration

1.1.2 Condition set according to the minimum value acquired

Select Min Value.

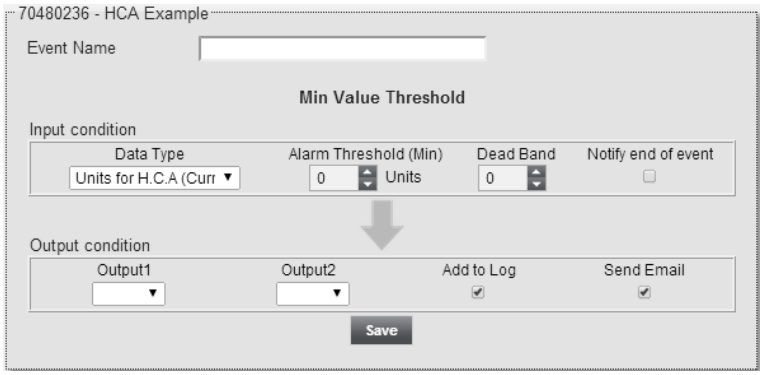


Figure 46 - Completing the creation of an event

The cells to be filled out are:

- Event Name: enter the name of the event being created
- Data Type: select the type of meter data. The data you can select are those that have already been set for every single meter. For more information, refer to Chapter 15.2
- Alarm threshold (Min): select an alarm threshold. The value can be both positive or negative
- Dead band: enter the value for which the condition does not occur. This feature allows the system to react with a certain delay to the actions to be taken based on the values measured beforehand

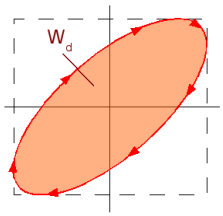


Figure 47 – Dead band

- Event closure notification: sends an email notification whenever an event is closed
- Output 1: when an event occurs, you can enable an operation according to the device connected to Output 1, such as:
    - Open: commands to open
    - Close: commands to close
    - Pulse: generates a pulse
- Output 2: when an event occurs, you can enable an operation according to the device connected to Output 2, such as:
    - Open: commands to open
    - Close: commands to close
    - Pulse: generates a pulse
- Add to Log: stores the alarm in the meter's log
- Send Email: sends an email notification in the event of an alarm (Ref. Chapter 5.4, 8.4.)
- Save: Press Save to save the configuration

1.1.3 Condition set according to the value out of range

Select the Out of range item.

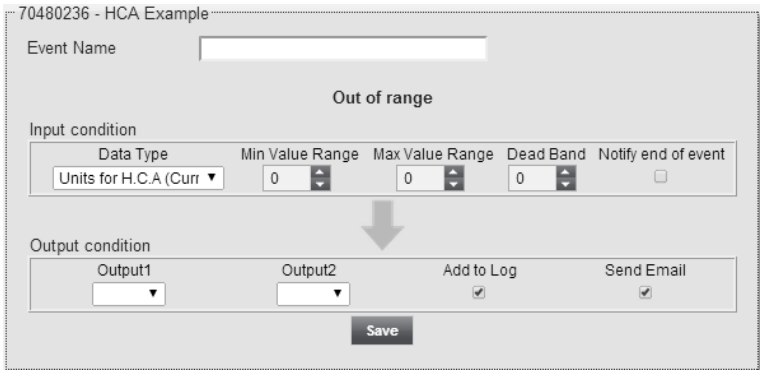


Figure 48 - Completing the creation of an event

The cells to be filled out are:

- Event Name: enter the name of the event being created
- Data Type: select the type of meter data. The data you can select are those that have already been set for every single meter. For more information, refer to Chapter 15.2
- Lower threshold: select the lower alarm threshold. The value can be both positive or negative
- Upper threshold: select the upper alarm threshold. The value can be both positive or negative
- Dead band: enter the value for which the condition does not occur. This feature allows the system to react with a certain delay to the actions to be taken based on the values measured beforehand

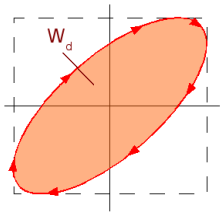


Figure 49 – Dead band

- Event closure notification: sends an email notification whenever an event is closed
- Output 1: when an event occurs, you can enable an operation according to the device connected to Output 1, such as:
    - Open: commands to open
    - Close: commands to close
    - Pulse: generates a pulse
- Output 2: when an event occurs, you can enable an operation according to the device connected to Output 2, such as:
    - Open: commands to open
    - Close: commands to close
    - Pulse: generates a pulse
- Add to Log: stores the alarm in the meter's log
- Send Email: sends an email notification in the event of an alarm (Ref. Chapter 5.4, 8.4.)
- Save: Press Save to save the configuration

1.1.4 Condition set according to the M-Bus status

Select the M-Bus status notify item.

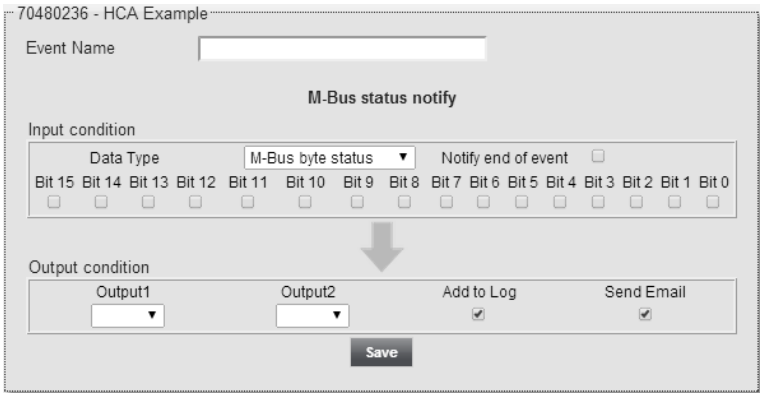


Figure 50 - Completing the creation of an event

The cells to be filled out are:

- Event Name: enter the name of the event being created
- Data Type: select the type of meter data. The data you can select are those that have already been set for every single meter. For more information, refer to Chapter 15.2
- Event closure notification: sends an email notification whenever an event is closed
- Word Definition: define a 16bit word to configure the new event to be created. Always refer to the meter's documentation for this type of configuration.
- Output 1: when an event occurs, you can enable an operation according to the device connected to Output 1, such as:
    - Open: commands to open
    - Close: commands to close
    - Pulse: generates a pulse
- Output 2: when an event occurs, you can enable an operation according to the device connected to Output 2, such as:
    - Open: commands to open
    - Close: commands to close
    - Pulse: generates a pulse
- Add to Log: stores the alarm in the meter's log
- Send Email: sends an email notification in the event of an alarm (Ref. Chapter 5.4, 8.4.)
- Save: Press Save to save the configuration

17. Exporting Data

This section allows you to process/export the data logged in the RTU. The data logged in every single meter are defined as shown in Chapter 15.2 and in Chapters13 and 14. The items that can be selected are:

- Create Reports
- Planning
- Repository

Every item will be described separately.

17.1 Create Reports

The pages to Create Reports are described below

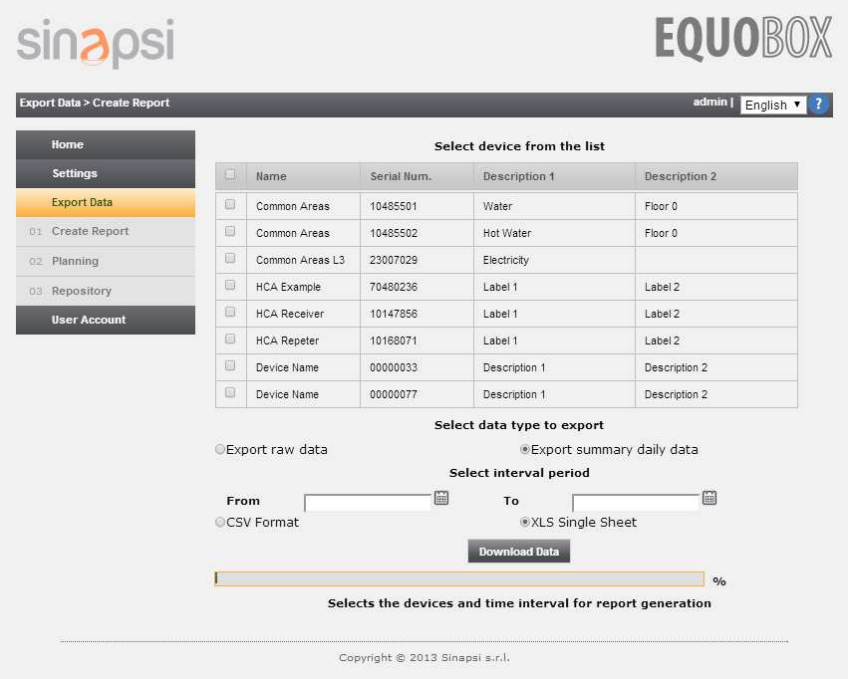


Figure 51 - Creating a report

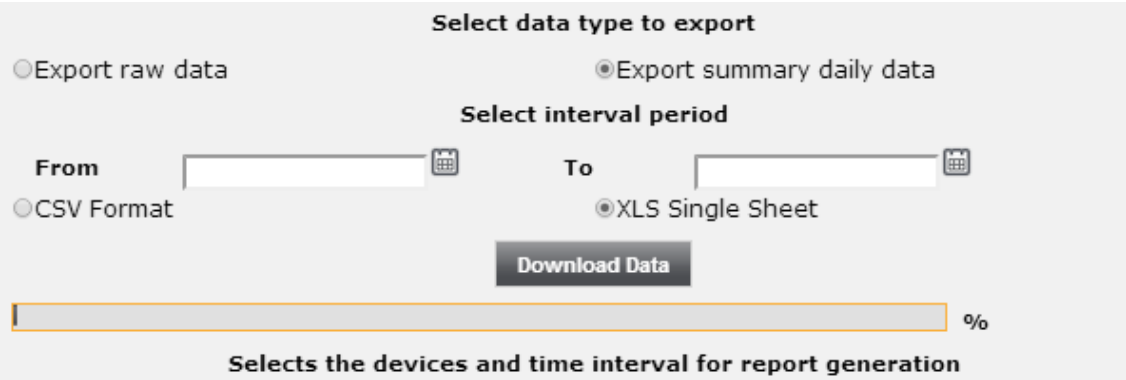
Select one or more devices from the list. For this option, all you have to do is select the box on the top left of the table. See Figure 51

	Name	Serial Num.	Description 1	Description 2
☐	Common Areas	10485501	Water	Floor 0
☐	Common Areas	10485502	Hot Water	Floor 0
☐	Common Areas L3	23007029	Electricity	
☐	HCA Example	70480236	Label 1	Label 2
☐	HCA Receiver	10147856	Label 1	Label 2
☐	HCA Repeter	10168071	Label 1	Label 2
☐	Device Name	00000033	Description 1	Description 2
☐	Device Name	00000077	Description 1	Description 2

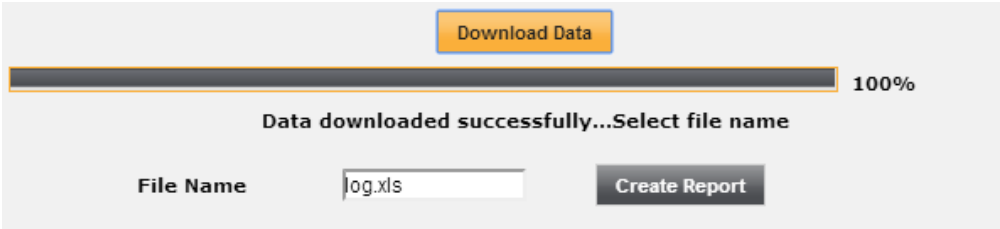
Figure 52 - Selecting the devices

The Create report menu is divided as follows:

1. Device data:
   - Name: Name allocated to the meter
   - Serial Number: Serial Number of the meter
   - Description 1: Description 1 associated to the meter. See Chapter 15.2
   - Description 2: Description 2 associated to the meter. See Chapter 15.2
2. Data to be exported: you can choose between two types of export:
   a. ***Export daily summary data. See Chapter*** 13.1***14***

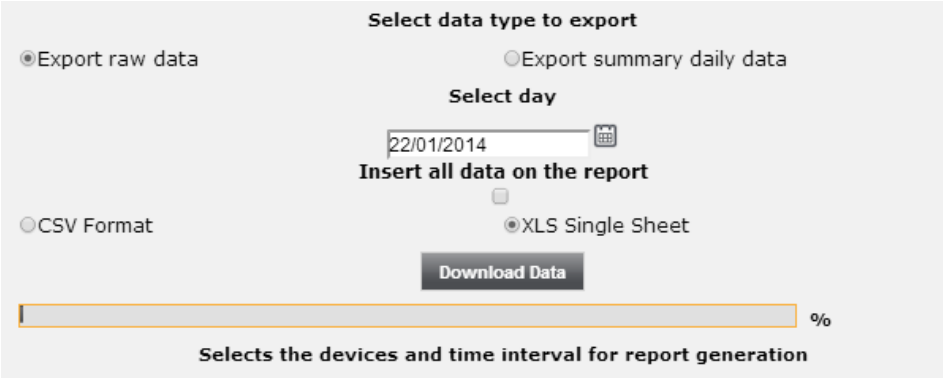


   - From: select the day from which to start the export
   - To: select the day on which to end the export
   - CSV format: to save in a .CSV file
   - XLS format: to save in a .XLS file
   - Press Download Data to download the data

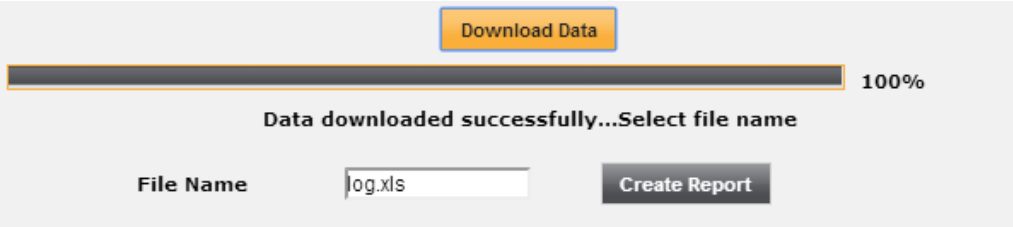


   - Allocate a name to the file to be generated
   - Press Create Report
   - Mouse over the newly created file and left-click on it to open it.

   b. ***Export RAW data. See Chapter 13***



- Select the day: select the day to be exported
- Include non-displayed data: select to export all the saved data
- Press Download Data to download the data



- Allocate a name to the file to be generated
- Press Create Report
- Mouse over the newly created file and left-click on it to open it.

If you use an .XLS format, press YES to view it correctly.

Figure 53 – Excel

17.2 Example of RAW data in xls format

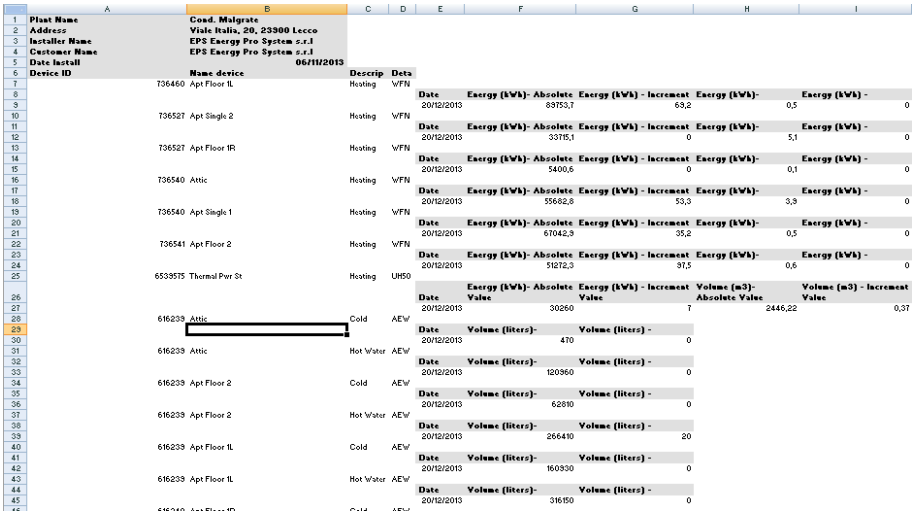


Figure 54 - Exporting RAW data in .xls format

17.3 Example of Summary data in .xls and .csv format

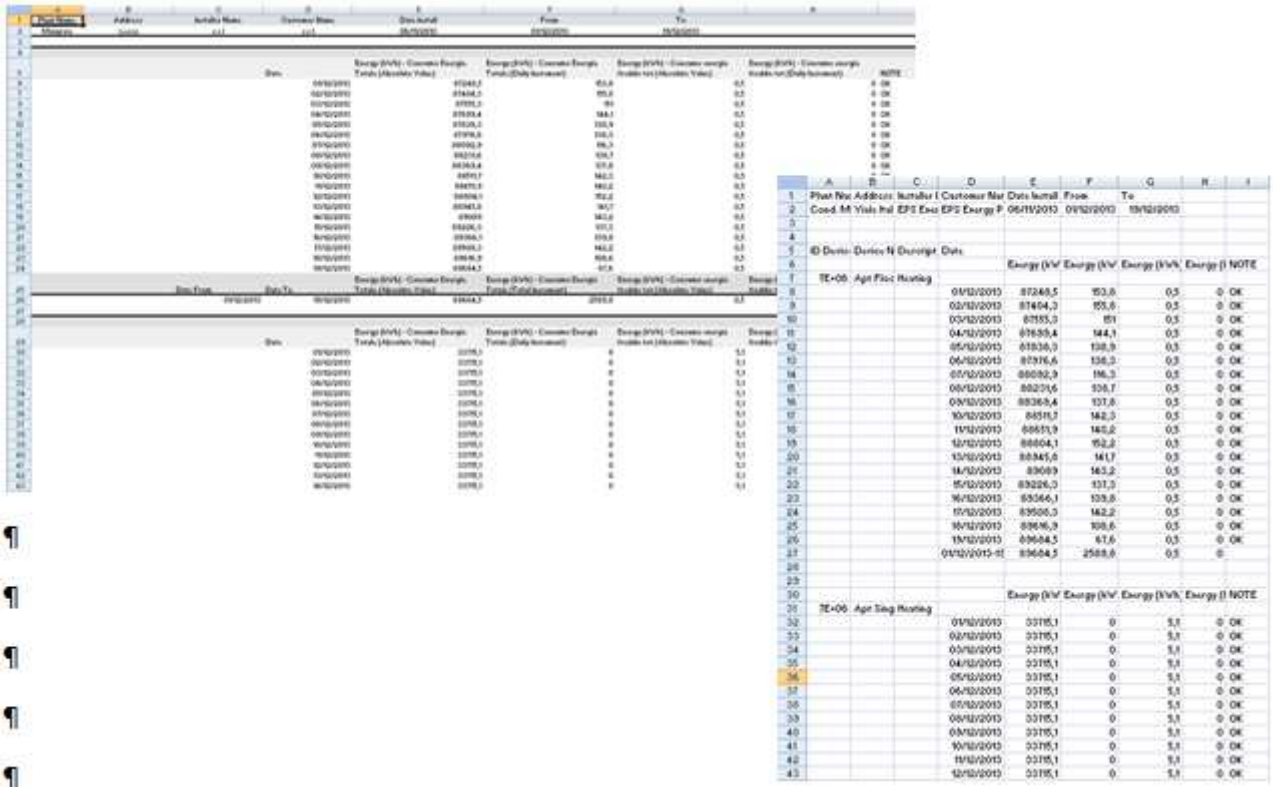


Figure 55 - Exporting Summary data in .XLS and .CSV format

Note: the extracted data from the system provide:

- ***Use of the point for the thousands***
- ***Use of the comma for the tens***

17.4 Planning

This section allows you to

1. choose the period when to create the reports that will be viewed in the future in the Repository section.
2. activate the File Transfer Protocol (FTP) to transfer the data to an external server

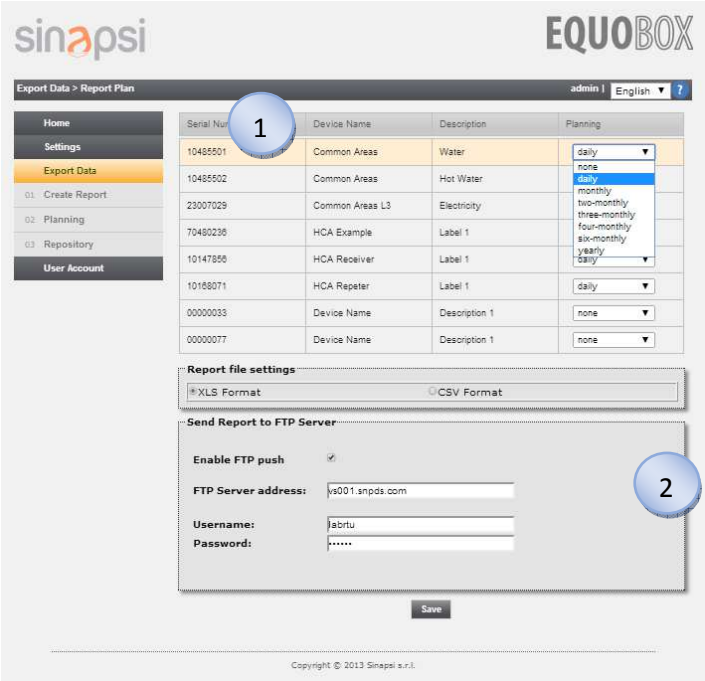


Figure 56 - Planning

Planning refers to every single device and the document that will be created can always be viewed in the Report Archive section. See Chapter 17.5. To set the planning of a device, select:

Serial Num.	Device Name	Description	Planning
10485501	Common Areas	Water	daily
10485502	Common Areas	Hot Water	
23007029	Common Areas L3	Electricity	
70480236	HCA Example	Label 1	
10147856	HCA Receiver	Label 1	
10168071	HCA Repeter	Label 1	daily
00000033	Device Name	Description 1	none
00000077	Device Name	Description 1	none

none
daily
monthly
two-monthly
three-monthly
four-monthly
six-monthly
yearly

Figure 57 - Planning

1. Planning

- None: no planning enabled
- Daily: enables daily planning at midnight of the current day
- Monthly: enables monthly planning at midnight of the last day of the month
- Two-monthly: enables bimonthly planning at midnight of the last day of the two-month period
- Three-monthly: enables quarterly planning at midnight of the last day of the three-month period
- Four-monthly: enables four-monthly planning at midnight of the last day of the four-month period
- Six- monthly: enables semi-annual planning at midnight of the last day of the six-month period
- Annual: enables annual planning at midnight of the last day of the year
- XLS report format: select if you wish to export the report to an .XLS file
- CSV report format: select if you wish to export the report to an .CSV file

2. FTP file transfer (File Transfer Protocol)

Figure 58 - FTP Activation

- Enable FTP push: select if you want to enable the FTP service
- FTP server address: enter the address of the FTP server
- Username: enter the username to access the FTP server
- Password: enter the password to access the FTP server

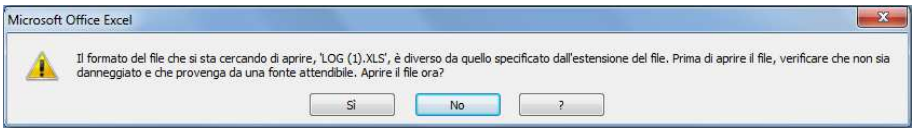
Press Save to save the configuration

17.5 Repository

The Repository section is the repository of all the planning documents created manually or according to plan (Ref. Chapter 17.1, 17.4). By selecting any file to be viewed, it will be automatically downloaded.

Figure 59 - Report Archive

Upon downloading the file, select it in the lower section of the browser page. A window prompting you to confirm whether you want to open the file will appear automatically. Press YES to open the file



18. Account Data

The Account Data section allows you to change the data to access the webserver account. You can use two types of account: admin and user.

The user account only allows you to view the data contained in the RTU

The admin account allows you to view and change all the data contained in the RTU

The default access data for the User are:

- Username: user
- Password: user
- Re-type password: user
- Press Save to save the configuration

The default access data for the Admin user are:

- Username: admin
- Password: admin
- Re-type password: admin
- Press Save to save the configuration

Figure 60 - Account configuration

19. Plant status

This section allows you to view the plant status. The items that can be selected are:

- Devices
- Event summary

19.1 Devices

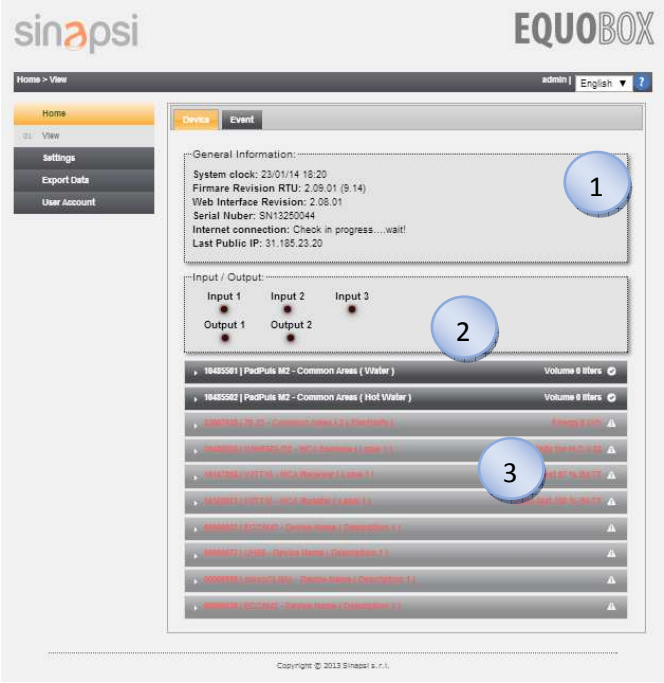


Figure 61 Plant status

The “Devices” screen is divided into:

1. General status
    - System clock: shows the current date and time of the RTU
    - RTU Firmware Version: shows the firmware version
    - Web Interface Version: shows the web interface version
    - Serial number: shows the serial number of the machine
    - Internet connection: shows the Internet connection status
    - Last public IP: shows the public address acquired by the RTU
2. Inputs/Outputs
    - Inputs: shows the input status in terms of their configuration
    - Outputs: shows the output status in terms of their configuration
3. Display meters:
    - Shows all the meters previously configured in the RTU. Every meter is displayed with its serial number, model, device name, description, and main value (Ref. Chapter 15.2). Select a line corresponding to a meter and a window with all the relative information will be displayed as shown in Figure 62. If highlighted in Red, it means there is an Error.

User description	MBus Description	Value
Total heat quantity	Energy	433518 kWh
Total volume	Volume	19791.31 m3
Heat power	Power	0.1 kW
Flowrate	Volume Flow	2 l/h
Flow temperature	Flow Temperature	50 C
Return temperature	Return Temperature	20 C
Temperature difference	Temperature Difference	30000 mK
Total volume last year	Volume - St: 1 - at (11/01/2000)	19791.31 m3
Heat quantity last year	Energy - St: 1 - at (11/01/2000)	433518 kWh
Heat power max	Power - Tariff: 1 (Max)	0 kW
Flowrate max	Volume Flow - Tariff: 1 (Max)	0 l/h
Flow temperature max	Flow Temperature - Tariff: 1 (Max)	50 C
Return temperature max	Return Temperature - Tariff: 1 (Max)	20 C
Error time	On Time (Error)	0 hours
Error time last year	On Time - St: 1 - at (11/01/2000) (Error)	47 hours
Heat quantity T1	Energy - Tariff: 2	109167 kWh
Heat quantity T2	Energy - Tariff: 3	339583 kWh
Heat quantity T3	Energy - Tariff: 4	0 kWh

Figure 62 - Detailed information

19.2 Event summary

This section allows you to view all the events processed by the RTU with respect to the configuration described in Chapter15.2.

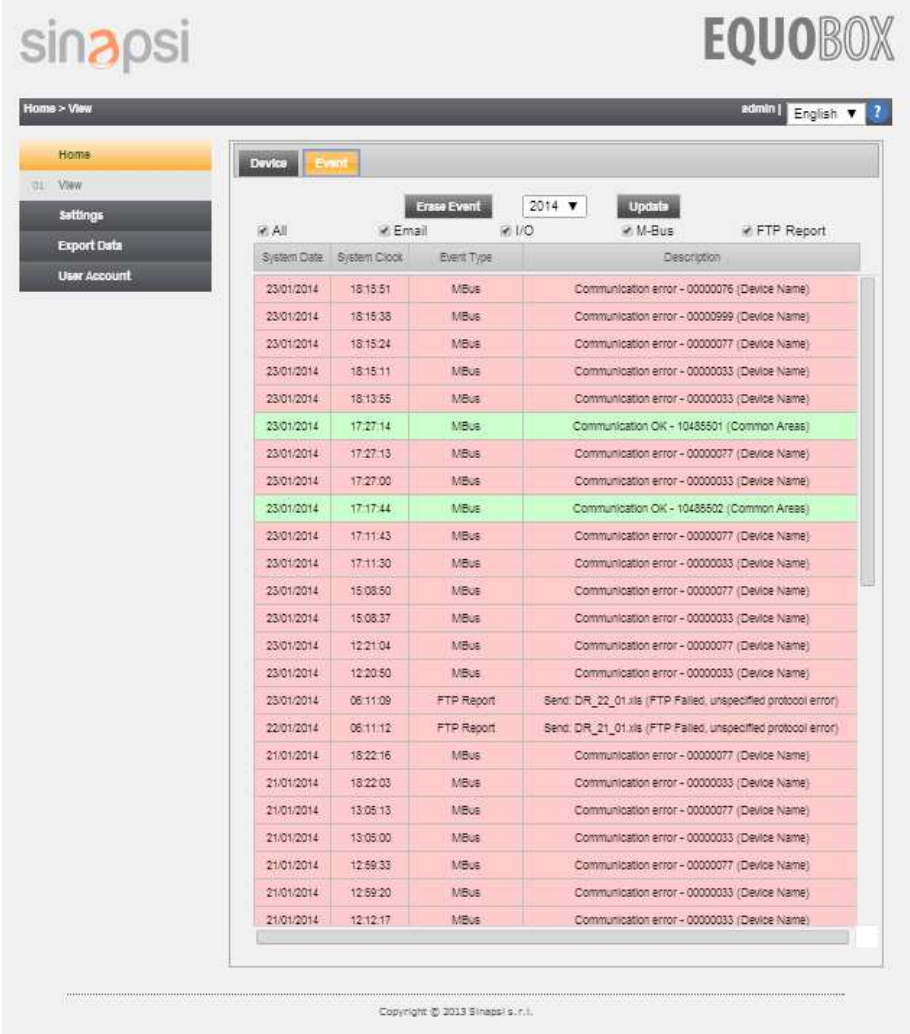


Figure 63 - Event summary

The items that can be selected are:

- Erase Event: allows you to permanently delete the events occurred during the year selected from the drop-down menu
- Update: updates the display of events according to the selected items described below
- All: shows, if selected, all the events
- Email: shows/hides, if selected, the events with email notification
- I/O: shows/hides, if selected, the input/output events
- M-Bus: shows/hides, if selected, the M-Bus events
- FTP Report: shows/hides, if selected, the FTP events

20. APPENDIX

20.1 ROUTER Configuration

The router is provided with an operating configuration. Should you need to change the parameters, proceed as follows:

- insert the SIM ensuring that it is PIN free
- connect the router to the power supply
- user a crossover cable to connect the router to the LAN port of a PC
- connect the antenna to the “GSM MAIN” output
- type in the following address in your browser:

  http://192.168.1.1

- You will be prompted to enter your access data:

Username	**Password**
admin	admin01

Upon accessing for the first time, a configuration wizard will help you to quickly set the basic information to ensure router operation. Check the connection status to ensure the presence of a signal. From the menu at the top, press “Status” followed by “Network Information”. A window will appear, as shown in Figure 64.

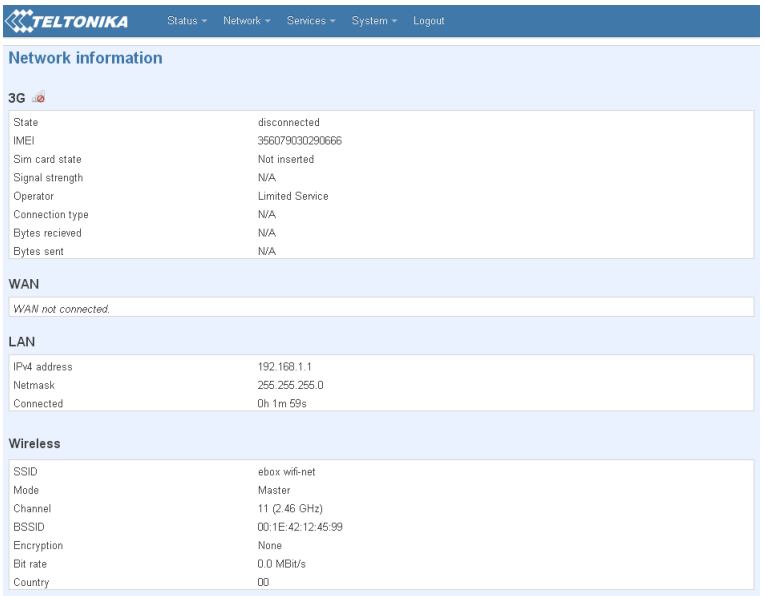


Figure 64 - Network Information

For an acceptable Internet connection, you need to have at least two green bars on the “Signal Strength” line. If not, connect the second antenna provided with the router to the “GSM AUX” output. A strong enough signal allows for Internet connection. If the IP address does not appear in the “IP Address” line, it means that there is no connection.

The “Network” section includes the sections in the initial wizard together with other functions. The following screen refers solely to the “3G” area. Figure 65shows the “3G CONFIGURATION” submenu to enter the APN.

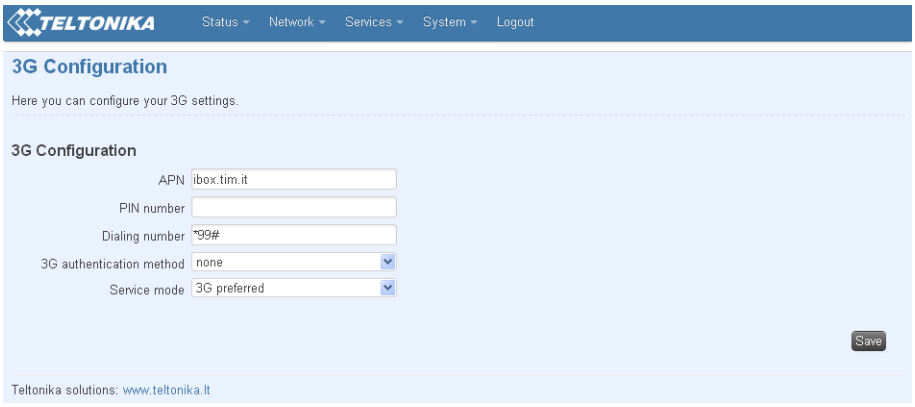


Figure 65 - 3G Configuration

Here you can change the details of your telephone provider by entering the type connection, APN (contact your provider’s customer service to know the APN of the SIM), login method, username, and password. You can also enter the PIN, but we recommend inserting a SIM that has this code disabled. For every operation, remember to select “Save” at the bottom right of every configuration page.

The screen below shows the “LAN” submenu, which is also part of the “Network” section. (Figure 66)

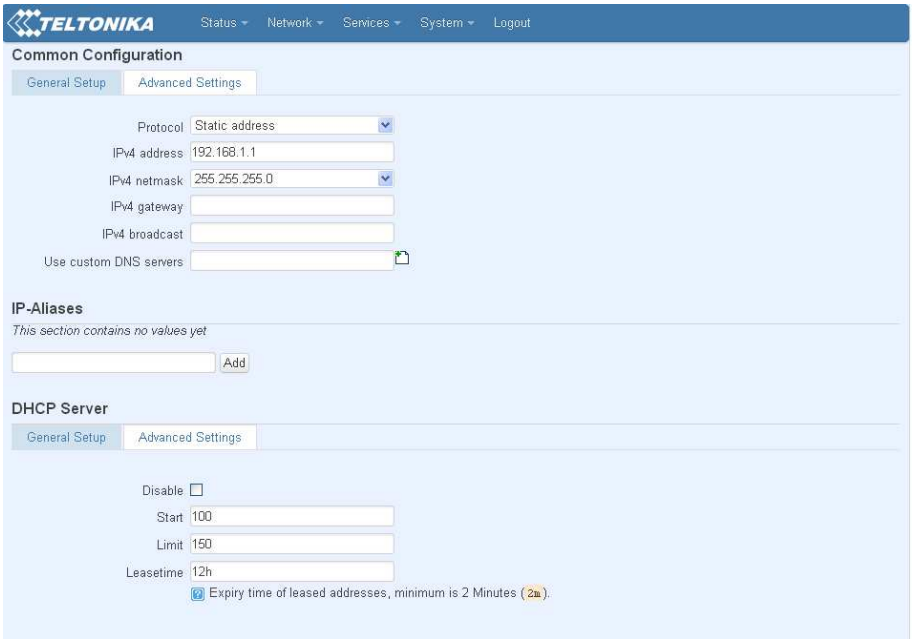


Figure 66 - Common Configuration

Here you can change the IP address of the Router and, if necessary, enable the DHCP function.

Should a wireless configuration be required, access the “Wireless” area from the “Network” menu. (Figure 67)

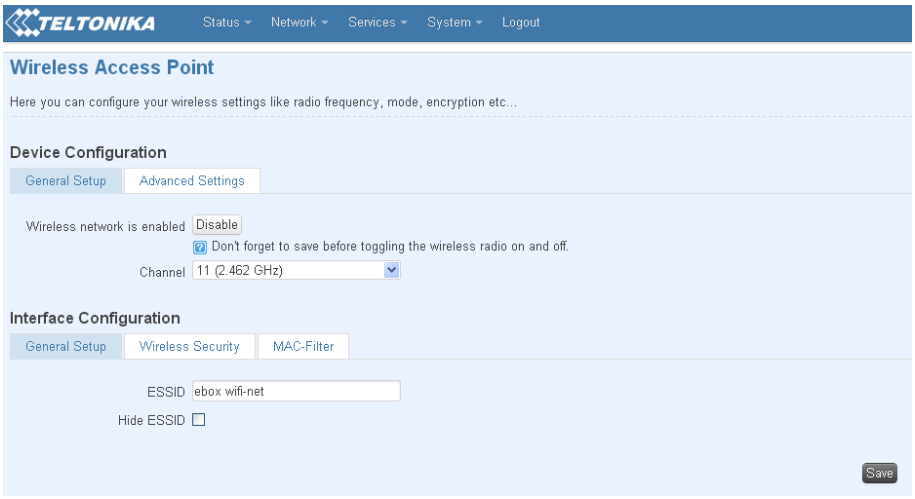


Figure 67 - Wireless Access Point

You can give a name to the connection and its encryption.

To enable the dyndns address, access the main menu at the top of the “Services” section and then the “Dynamic DNS” submenu as shown in Figure 68.

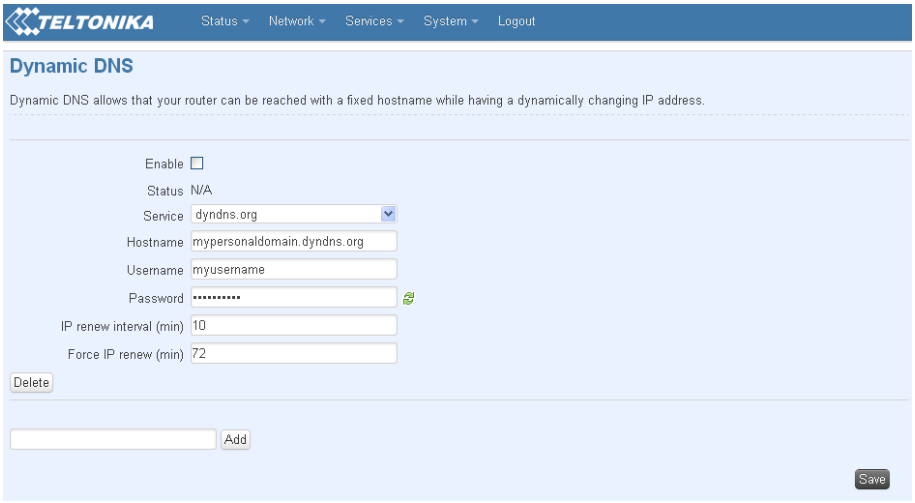


Figure 68 - Dynamic DNS

Remember to select “Enable” and, if necessary, press “Save” on the bottom right.

To use Port Forwarding rules, press “Network” from the main menu and then “Firewall”. From the submenu that will be displayed, you can access the “Port Forwarding” section and set its rules. (Figure 69

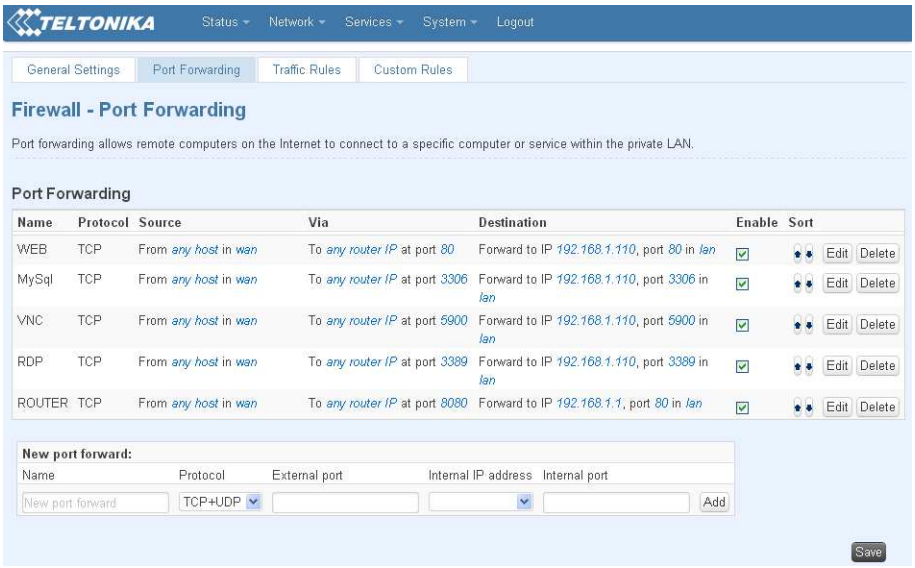


Figure 69 – Port Forwarding

"Port Forwarding" rules must be created in the event it is necessary to reach the machine from a public address. This function allows to redirect Internet traffic to the machine, which responds via port "80". Port Forwarding allows the machine to be reached via this port and be redirected to another device or function via a secondary port. Press Add to create a new rule. The newly created rule can be modified at any time, simply by pressing "Delete". Remember to press "Save" and then "Reboot" to make the changes effective.

Press "Firewall" from the menu at the top and then "Traffic Rules" to set security functions, such as addresses to be filtered, set HTTP addresses or asymmetric cryptographic protocols to manage the transfer of confidential information (Figure 70).

In the General Settings area, you will find "DMZ Zone", which is a connection between a public address and a machine address. Remember to select "Enable" and, if necessary, press "Save".

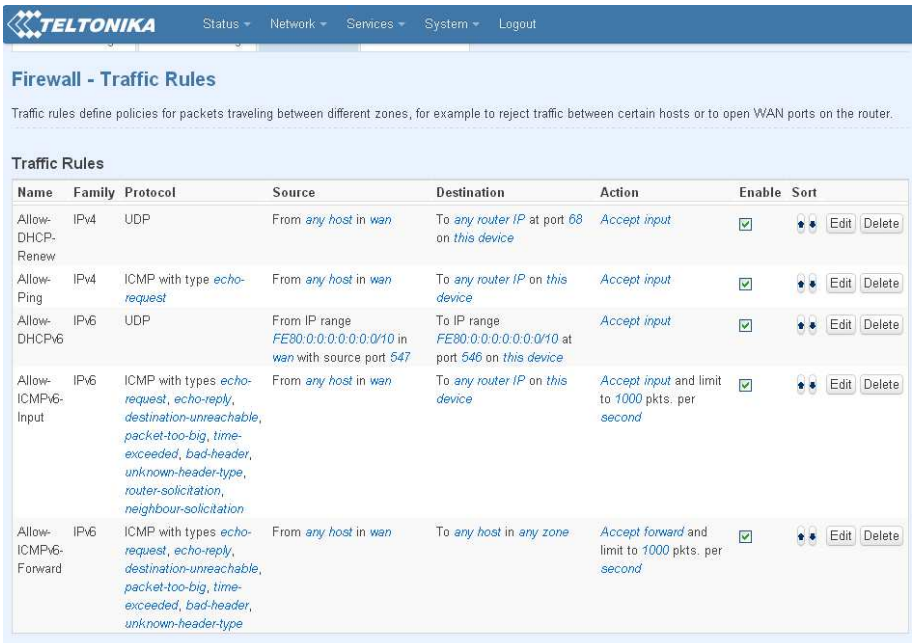


Figure 70 - Traffic Rules

Should you wish to use the SMS service to receive the router status or reboot if from your cell phone, you can enter your phone number and select the “Enable” box (Figure 71). You can perform the two operations shown in the figure by sending a message from your telephone to the number of the board inserted in the router. The content of the message must be identical to that in the “SMS text” field (e.g. reboot). You will receive an SMS confirming that the operation has been carried out.

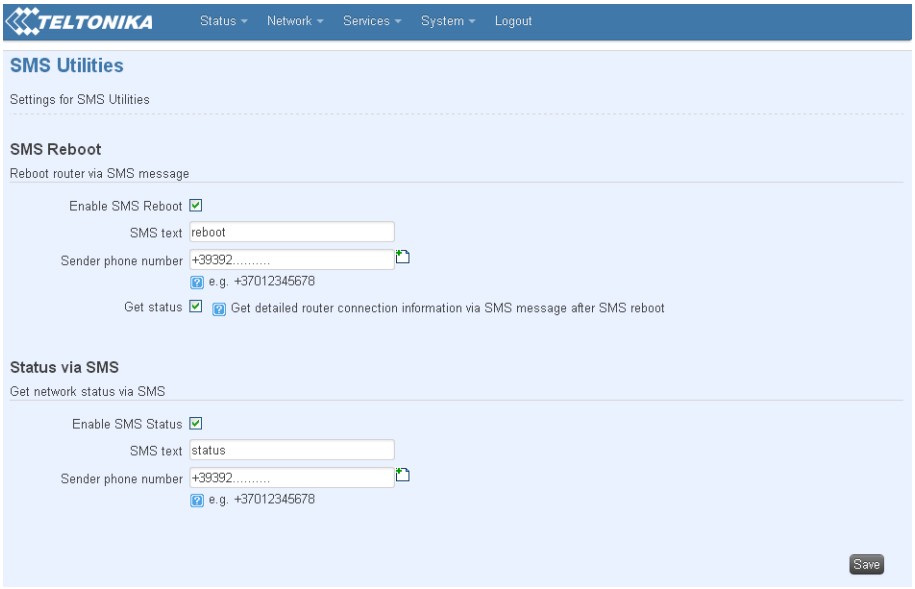


Figure 71 - SMS Utility

To change the system password, access the “System” section from the main menu and click on the “Administration” submenu (Figure 72). You can upgrade the Firmware or upload a previous configuration from “Backup and Firmware” in the “System” submenu (Figure 73).

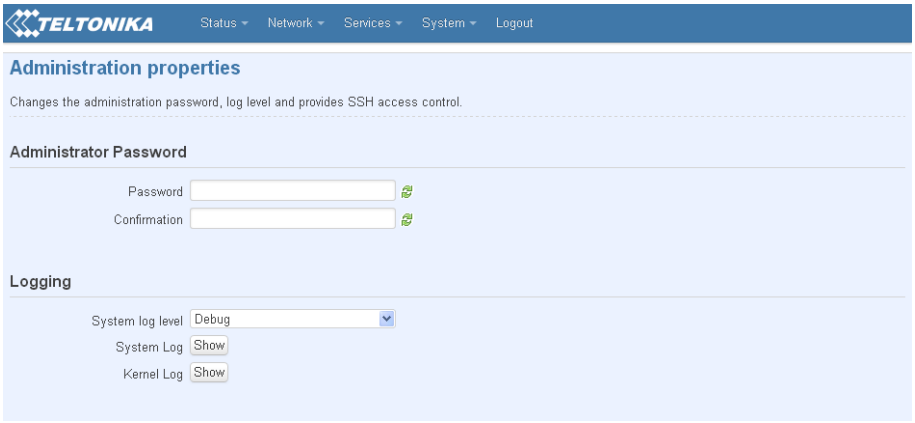


Figure 72 - Administration properties

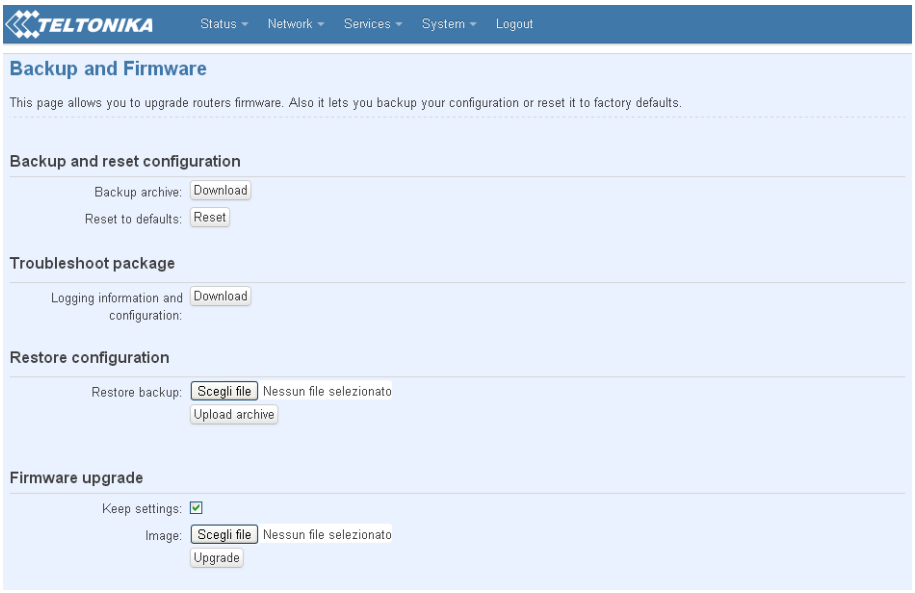


Figure 73 - Backup and Firmware

To set up the Dynamic DNS service go to menù Services, Dynamic DNS. Figure 74

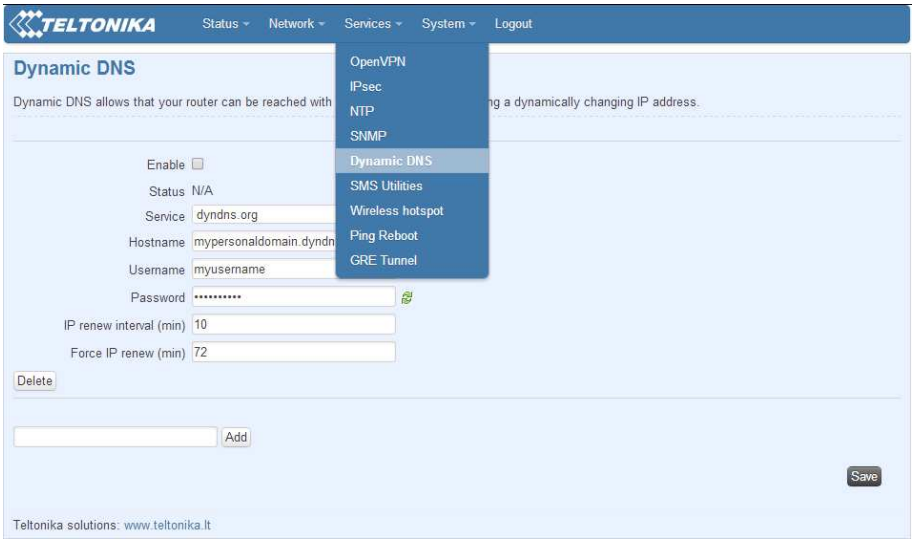
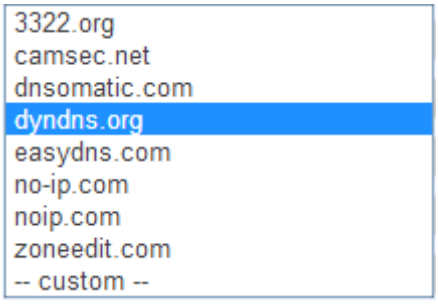


Figure 74 - Attivazione servizio Dinamic DNS

Select from the following service



Upon completion of insert check Enable and populate fields. Vedi Figure 75

- Service: select the service from those offered

- Hostname: enter the Hostname of the service
- Username: enter the username for access to desired service
- Password: enter the password for access to desired service
- IP renew interval (min): enter a time interval for the renewal of IP. If not specifically requested leave the default value
- Force IP renew (min): enter a time interval to force the renewal of the IP. If not specifically requested leave the default value

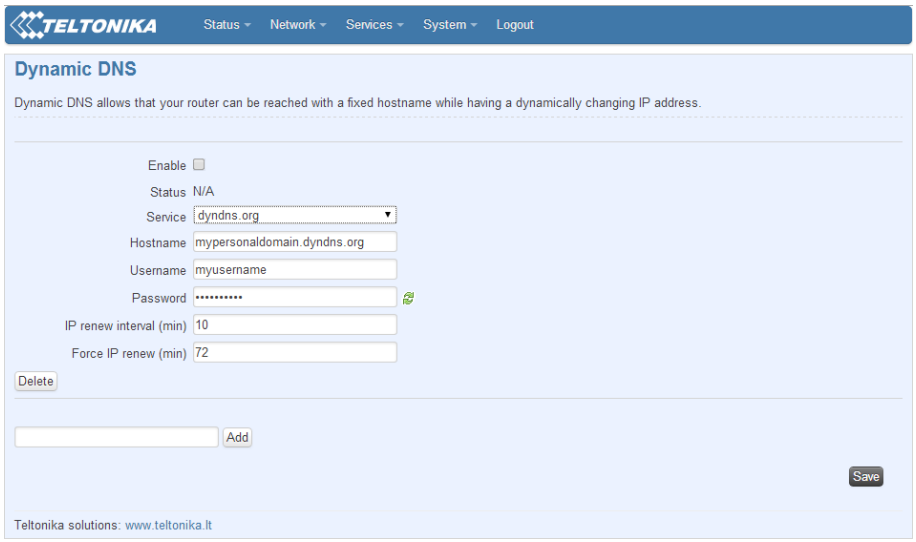


Figure 75 - Configurazione parametri accesso per Dinamic DNS